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Ontario
1905

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FOR THE YEAR

1905

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John A. Amyot, M.D.

The Chairman's Annual Address.

E. E. KITCHEN, M.D., St. George

Presented at the Regular Meeting of the Board Held January, 1905.

To the Members of the Provincial Board of Health:

GENTLEMEN,—I am pleased, indeed, to see the members of the Board in their usual good health, and prepared to perform their important duties.

True, death has not invaded our body during the past year, but, an old member, Dr. McCulloch who had retired from us a couple of years ago on account of ill-health, has at last succumbed to his ailment of years, and I am sure, you will all join me, in warmest sympathy with the widow in her great loss.

It was my intention to have called you together a couple of weeks earlier, but, owing to a number of reasons was unable to do so.

I am sure that you all are equally glad with myself, of the large amount of good practical work which we have been able to accomplish during the year 1904, and that you will be equally pleased with the very satisfactory condition of the health of this fair Province during that period.

For twenty-two long years we have been striving to make our land one of the healthiest places on this earth, and I am sure that the following report of the year just closed will bear me out in saying, that in no year have we had better results than in the last.

The health of the people has been fair, and I now will place before you, the statistics, of a few of the contagious diseases, to show what has been done with them.

Scarlet fever, had its greatest mortality during the months of January, February, and December, being 24, 13, and 15 respectively,, while the least was in the months of May, June and September, being 7, 5, and 7. The mortality for the year reached 129, while the preceding year it was four times greater, reaching 529.

Smallpox, that has given so much trouble for a number of years, has the past year had only four deaths. The expense of suppressing the two outbreaks in the new districts, cost but $1,500.

Diphtheria, has likewise had a marked decrease. The greatest mortality was during the months of January, March and December, being 55, 48, and 65, respectively, while the least was in July, August and September, being 13, 25 and 20. The number of deaths from this disease during the year was 438, while 478 succumbed to this malady during the previous year.

Measles had a mortality of 32 in comparison with 53 of the previous year.

Whooping cough carried off 90, while in the previous year 148 succumbed to this trouble.

Typhoid fever had a mortality of 397 in contrast with 298 during 1903. This increase was no doubt owing to the larger number reported, being the result of the notifications sent out last year to the medical men of the Province. It is to be regretted that so far, the hospitals have paid but little heed to the notification of this disease. Its greatest mortality was during the months of September, October and November, being 66, 63 and 43 respectively. It is a noted fact, that immediately after the circular had been sent to the profession explaining to them that the law required the notification of typhoid patients within 24 hours, that the reports showed an immediate increase, soon being five fold greater.

Likewise the number of deaths from tuberculosis has slightly increased, being 2,168 in comparison with 2,072 in the preceding year. The greatest number of deaths occurred during March, April and May, 200, 219 and 229, respectively, while the least were during September, October and November, being 145, 159 and 127.

It is a matter for thought, that while the whole number of deaths from contagious diseases, minus tuberculosis, is 1,790, the number of deaths from tuberculosis alone, is 2,168.

The time has arrived when this disease should receive notification. I do not mean that the house should be placarded, neither is that necessary for typhoid fever, but the Secretary of the local Board of Health should be notified, so that information and other assistance might be given to the family, in order to avoid contagion, etc. I fear it is not generally known that the Act, requires local health authorities to provide physicians with blank forms, whereon to report contagious diseases.

The Conference on School Hygiene held in Toronto last February, was very successful, and resulted in the appointment of a strong committee, with the approbation of the Minister of Education, that will make experiments, bacteriological and chemical, upon the air of schools, etc.

The matter of sewage disposal and a good water supply has been, and is yearly proving of more importance to this Board and the people at large. During the past year the sewerage systems of Oshawa, Bridgeburg, Wiarton and Collingwood were approved with amendments, while the Palmerston plan, as submitted was disapproved, as was also that of Rat Portage. The Port Hope extension and the Ottawa East changes, met our approval, and the Berlin and Stratford systems for extension, were commended as was also their provisions for a septic tank treatment.

Toronto asked the assistance of the Board, regarding the proposed Trunk sewer and disposal system, which was readily given; and for a year, samples of sewage will be regularly collected and examined in our laboratory, the object being to ascertain the quality of the sewage at the different outlets as it is now a well known fact that to treat sewage intelligently, the composition of it must be known. It is my impression that the time has arrived when an experimental sewage plant should be established in this city so that the leading enemy to health might be studied in a truly scientific manner.

The water systems of Oshawa, Creemore, Grimsby, North Bay, and East Toronto have been approved while Thamesville will have a further examination made of its water. A gratifying fact is the increased number of villages and small towns that are taking upon themselves the formation of waterworks.. As a town gets a good sanitary water supply, and a proper disposal of the sewage and filth, so will the mortality largely decrease.

It is a matter for consideration if the time has not arrived for the appointment of an Inspector over the sewage and waterworks systems.

The reports of our Bacteriologist, Dr. Amyot, tendered to us quarterly are of infinite importance. During the past year he and his assistant have spent some time investigating the patent medicines, foods, beef extracts, etc., and while the amount of alcohol in the patent medicines has been large, the foods, etc., were found to be freer from deleterious ingredients than anticipated; although often made up with cheaper matter than the name implies. This work will be continued.

During the past year Dr. Connell, of Kingston, has been appointed assistant to Dr. Amyot, with offices in that city. He has sent in his first report which is very creditable and will be published with the Laboratory Report. It may not be amiss in saying that London and Fort William have applied to have branch offices. In view of these facts and also that the Board has for a long time, been working for County Health Officers, would it not be well to advance the latter again. Then the officers could do the work intended for these to do, as well as that of the local health officer.

The University of Toronto has established a course for the Degree of Doctor of Public Health, and expect a number to enter during the summer upon that course. This has been established, largely, to educate Health Officers for County and other work, and it is hoped it will be the means of doing the great benefit that its friends so confidently anticipate.

Dr. Bell, of London, has been appointed Medical Inspector to this Board, and has already entered upon his duties.

Before closing I wish to refer to a new departure: that of doing away with our Annual Report, which we were never able to get out till some six months after the year closed, and in its place having printed a quarterly report under the cognomen, "*The Sanitary Journal*." Owing to the year being well advanced before it was taken up it has not appeared as early or as regularly as we hope it will during the current year. Not only will our work be in print shortly after each quarterly meeting, and thus a year in advance of the old Annual Reports, but this great and important change has been made without any addition to the expenditure.

We have likewise been able to place a copy of the Journal in the hands of every physician in the Province; also to have it well circulated amongst the local Boards of Health. We hope by this means not only to keep these gentlemen in touch with us, but to be the means of disseminating a large amount of knowledge to these Boards and the Sanitary Inspectors, etc.

It is with a great deal of pleasure that I speak of the prompt and intelligent way in which Dr. Hodgetts performs the duties of his office, and although those duties are yearly increasing he and his faithful staff, keep up, and well to the fore with their work.

(Signed.) E. E. KITCHEN,
Chairman.

February 1st, 1905.

Quarterly Report of the Secretary.

CHAS. A. HODGETTS, M. D.,

Presented at the Meeting of the Board Held January, 1905.

To the Chairman and Members of the Provincial Board of Health of Ontario:

GENTLEMEN,—I beg to submit the returns for contagious diseases for the quarter ending December 31st, 1904.

	1904.		1903.	
	Cases.	Deaths.	Cases.	Deaths.
Smallpox	5	0	25	0
Scarlatina	550	33	739	38
Diphtheria	992	144	1,491	202
Measles	138	9	....	7
Whooping Cough	88	12	....	35
Typhoid Fever	504	145	407	97
Tuberculosis	462	445	....	475
	2,739	788	2,662	854

In comparison with those of the corresponding quarter of the previous year it will be seen that there has been a decrease in the number of cases reported as suffering from the following contagious diseases:—smallpox, scarlatina and diphtheria, while there has been an increase in those of enteric (typhoid) fever, with also an increase in deaths from 97 to 145. It is gratifying to note that the deaths from tuberculosis dropped from 475 in the corresponding quarter of 1903, to 445 in 1904.

As this quarterly return completes the figures for the year 1904, we are enabled to make a comparison with those reported for 1903. It might be as well to point out that the figures given in the reports of the Board of Health must at all times be considered as merely tentative, chiefly from the fact that they are never complete, only a percentage of the reports of the municipalities having reached the office at the date of compiling each monthly report. The more correct and reliable death returns are those of the Registrar General which are made up after the returns have been received from the Division Registrars, but this report always takes a year to compile hence for general health purposes the Board's monthly returns must be considered as generally indicating the health of the people.

In tables A and B will be found the report for the year as also that for 1903, by quarters. As an example of the difference between the two reports the number of deaths from tuberculosis reported for the year 1903 were 2,072, in the first quarterly report of 1904, while the death returns as just compiled by the Registrar General's Department show 2,745, or a difference of 673.

It will be seen that there is a slight falling off in the total monthly average of population reported upon as compared with 1903; this is due to the failure of Division Registrars to make their returns promptly, in some instances they fail to report after a couple of reminders. The total deaths as reported from all causes were 25,415, as compared with 25,267 in 1903, or a rate of 12.8 per 1,000 of the population reporting, as against 12.6 in the previous year.

Comparing the deaths from contagious diseases it is particularly gratifying to note that while the deaths from all causes have decreased by 14.8, those due to preventable causes have decreased by 340 or nearly 10 per cent. The great diminution in deaths occurred in scarlatina, of 400, diphtheria also showing a decrease of 40, smallpox and whooping cough 58; the increases being in enteric 99, and tuberculosis 95.

The fact that those diseases which owe their spread chiefly to infection, especially diphtheria and scarlatina, show a very material decrease both in the cases reported and in mortality is to the sanitarian particularly gratifying, from the fact that their diminution is evidence in part possibly to the mild character of the disease, and part to the desire of the profession and the public to assist the local health authorities to enforce the Health Act and the Regulations of the Board, for while there are those in every community, both amongst the public and the medical profession, who will resort to unfair means to evade the notification of cases of contagious diseases yet, on the other hand, the majority of parents are impressed with the fact that in the public interest each and every case should be notified, and all proper precautions taken to prevent their spread of disease. To the credit of the profession, be it said, the majority honestly endeavor to prevent what from a monetary standpoint it is to their benefit to let pass unnoticed and unreported.

In the case of diphtheria it had been hoped that the use of anti-diphtheritic serum would have had an appreciable effect upon the death rate, but this year it is somewhat higher than in 1903. In this regard it is to be regretted there is no data to show upon what percentage of cases the same has been administered.

The increase in deaths from enteric fever and tuberculosis calls for more than passing notice, the former being chiefly a water borne disease, is one which owes its origin mainly to a contaminated water supply, either a well or a public system, and therefore it should be the especial duty of the local authorities to maintain a more careful oversight of this essential of life, and to this end a systematic examination of all waters used in a municipality, whether it be a rural or urban district, should be entered upon by all Boards and funds should be provided for such purpose, and this Board should make an annual inspection of all public systems, with an examination of specimens taken at different points in each system, having a care also of the yearly increase of sewerage systems, indeed every city and all large towns should have its own laboratory.

At the Congress of the Royal Sanitary Institute held in Glasgow in 1904, a paper was read by Dr. James Robert Kaye, Fellow of the Institute, on "The Supervisory Control of Water Supplies," in which he pointed out the need there existed in Great Britain for power being vested in a central authority whose powers "must be large enough to take a broad and complete view of the situation, yet not too large to undertake the co-ordinating and supervising of the actual local or parochial control, which is so badly needed especially in some of the following directions" :—

1. To supervise the collection, storage, and distribution of water supplies, with power to inspect all works. To direct measures for the better husbanding of supplies where necessary, and to promote economy by suitable combination of districts. To see that there are no unauthorised departures

from schemes as approved. To frame regulations for the protection of gathering grounds and to enforce the exclusion of particular supplies where necessary. To approve of emergency measures in the case of scarcity of unforeseen eventualities.

2. To establish and carry on a regular system of comparative examination (physical, chemical and bacteriological) of all the public water supplies in their area, and thus gradually build up standards for each supply. Experience has shown, over and over again, that the significance of analytical data is relative and not absolute; that is to say, the early detection of slight mischief can best be made by comparison with previous regular records of the same supply.

3. To supervise all means for the corrective treatment of each supply, e.g. storage filtration, softening processes, chemical treatment for the prevention of plumbo-solvent action, etc. As things are at present these processes usually give excellent results when first established, but changes in the staff or personnel of the water authority often induce corresponding changes in the efficiency of the treatment, or considerations of finance and local politics bring about laxity and irregularities of which the consumers of the water remain in blissful ignorance. The recent report of the Local Government Board on lead poisoning has clearly shown that this single phase of the supervision of water supplies is an urgent matter of no little magnitude, affecting both old and new supplies in many parts of the country, and having no connection whatever with the function of a Rivers Board.

4. To keep a watchful eye on the health statistics of the various communities within the area, with a view to studying the influences of the water supplies upon health at all seasons. To investigate any disturbances observed, and to apply remedies.

5. To group together areas for the purpose of distribution, and to secure water from them on equitable terms, and generally to represent their interests in obtaining adequate and permanent supplies, and preventing the depletion of their natural sources by outside districts.

6. To regulate, supervise, and enforce where necessary the supply and the use of water for other than domestic purposes in the interests of the public health, e.g. sewer flushing, road watering, etc.

Fortunately most of the powers referred to are now quite within the province of this Board to put in force and with your approval I purpose to begin a systematic examination this year.

Regarding tuberculosis the hope can only be expressed that the recommendation made by this Board to the Minister should be again repeated, viz., that this disease should be placed upon the list of notifiable diseases, and that the local authorities and physicians should encourage the reporting of all cases, and adopt means for the careful disinfection of rooms and houses after patients have vacated them.

Again, I would impress upon the public of this Province, upon the Mayors, Aldermen, Wardens, and the County Councillors, the stigma which rests upon them by failure on their part to show any inclination to grapple with this serious and important question, of providing by means of public municipally owned sanatoria for the care of this unfortunate class of our fellow citizens. If it had been found that 4,237 hogs, sheep or cattle, worth anywhere from $2.50 to $100 each, had died in the Province during 1903 and 1904 from a contagious disease, and that in addition to this many thousands more had become infected with that disease and would ultimately die, all this to the direct financial loss of the farmer and indirectly to the public at large, there would be such stir over the length and breadth of the Province that the Minister of Agriculture would be forced to take immediate action to prevent this serious loss to the people, and he would be justified in so doing. He would not, however, relegate his action along the lines of cold charity, the expense would have to be borne by some one or other of the recognised authorities of the Province; just so then should this Province deal with tuberculosis of which we have reported 93 more deaths in 1904 than in the previous year, or a total for the two years of 4,237 human lives, each worth to the Province from $1,000 to $1,500, and how many thousands these poor mortals infected before crossing the bar will never be known. Yet such is the apathy, indifference, nay, I would call it criminal negligence, of the people of Ontario that outside the accommodation provided for those who are fortunte enough to be able to pay for their maintenance in an institution maintained by a private organization, and another kept as a charity by the same body, there is absolutely no provision for the majority of 2,100 who will probably die of this disease during 1905. For this reason they must live surrounded by their relatives and friends an increasing source of danger to everyone. Will not some municipality or district avail itself of the opportunity offered by the Act respecting Sanatoria, and inaugurate this good work?

APPLICATIONS FOR SEWERS.

During the quarter the only application received re sewer construction was one from the Town Engineer of Rat Portage looking to the installing of a septic tank at the foot of Argyle Street, before the sewage is run into Laurenson Creek, this has been submitted to the Committee on Sewage.

I have to direct your attention to the fact that the corporation of Port Arthur has installed a system of public water supply without having submitted the plans, etc., to this Board for approval, and that the corporation of Burk's Falls in a similar manner has also installed a water system. As the Public Health Act, Section 30, requires that the council of any city, town or village shall submit such questions together with plans, etc., to the Board and receive the sanction of this body before proceeding with the same, it is for this Board to consider what action shall be taken in view of the flagrant violation of the Act, for if such action on the part of municipal authorities is to pass unnoticed it will be but a short time before its authority and wise oversight is again usurped and the public duped into paying for systems that may not only be utterly unsuited for the growing needs of a community, but a public water supply may be thrust upon them which may be detrimental to health. Indeed it is hard to believe that the bonds or debentures necessary to initiate such works can be realized upon when the approval of this Board has not been granted.

LEGAL ACTION UNDER CRIMINAL CODE.

A complaint was laid before the Board at the special meeting held in Collingwood, August last, regarding the deposit of night soil and manure in the Valley of the Don, in the Township of York, adjacent to the limits of the City of Toronto, which "dump" was a nuisance to the vicinity. After consideration of the communication the matter was referred to your Secretary to investigate, and thereafter confer with the Attorney General regarding the same if, in his opinion, the condition of affairs warranted it. I am pleased to inform you that the Crown Attorney was instructed to indict Mr. Nelson, the proprietor, before the next grand jury as committing a nuisance under section 191 of the Criminal Code with the result that the case came to trial at the last general sessions before His Honour Judge Morgan and a jury. After a large number of witnesses had testified, amongst them Dr. C.

Sheard, M.H.O., of the City of Toronto, and two of his oldest Sanitary Inspectors, all of whom did not consider the accumulation of some thousand tons of night soil soaked manure a nuisance, or detrimental to public health, a verdict was given against the defendant, who must necessarily discontinue the depositing of night soil in this manner, although the township authorities had granted a license to the proprietor.

This decision must necessarily lead the health authorities of the City of Toronto to adopt some more modern method to dispose of its accumulated night soil in place of the antiquated one just condemned. The cost may be greater to the city but there is no reason why this wealthy corporation should endeavor to evade the responsibility very naturally placed upon it, as indeed upon all cities and towns, of disposing of excrement and refuse, scientifically, economically and without creating a nuisance to the dwellers of rural or suburban districts, the like of the latter of which would not be permitted within the urban municipality. The verdict should also be a warning to other like offenders in the Province.

While discussing legal matters I would again refer to the action of

JUDGMENT ON APPEAL RIDGETOWN SMALLPOX OUTBREAK.

It will be remembered that Justice Falconbridge in the actions Ward v. Lowthian; Green v. Marr, dismissed the two. The principle involved in the first case in the responsibilty resting on municipalities and local health authorities to provide hospital accommodation for smallpox patients and their liability for damages to Ward's business, that of an hotelkeeper, by reason of his place of business being used as a hospital. The following is the law report of the cases:—

Before Meredith, C.J., Maclaren, J.A., Teetzel, J.

WARD v. LOWTHIAN; GREEN v. MARR.

Judgment (G. A. B.) on appeals by plaintiff from judgment of Falconbridge, C.J., (3 O.W.R. 362) dismissing two actions tried together at action. Ward's action was against the five members of the local Board of Health for the town of Ridgetown, individually, F. B. Marr and John Golden, two members of the medical profession, who were alleged to have been medical health officers for the town, and against the local Board of Health as a corporation. Ward's action was for damages for using plaintiff's hotel in Ridgetown as a smallpox hospital in February, 1903.

Green's action was against the same defendants for taking him to the temporary hospital, although he had not the disease, and keeping him there until he contracted it. Held, that upon the facts and the law both actions failed, and were properly dismissed at the trial. Appeals dismissed with costs. M. Wilson, K.C. and W. A. F. Campbell (Ridgetown) for plaintiffs. W. Mills (Ridgetown) for defendants.

From this decision it is quite evident that the Public Health Act is not as strong either as the Board has intrepreted it or intends it, or as it should be for the proper protection of the public. The matter was placed in the hands of the Committee on Legislation before the appeal decision was rendered, but I am of the opinion the question should still be further appealed, for as it now stands much of the Public Health Act is a dead letter, especially that portion relating to the municipal care of contagious diseases.

CERTIFICATE OF THE ROYAL SANITARY INSTITUTE.

I would again direct your attention to the work of the Royal Sanitary Institute of Great Britain, which has adopted a uniform system of examination for Sanitary Inspectors whereby a certificate is granted in both Great Britain and the Colonies, which certificate qualifies holders to engage as Sanitary Inspectors in the former country and many of the colonies. As at present no system prevails in this country independent of that introduced by the Institute, I would recommend the plan for your consideration. With the extension of public health work in the Province, and the introduction of water and sewerage systems, it is essential that this class of officials should receive instruction and that a standard of qualification should be set. The plan proposed has in its favor that of being conducted under the patronage of the oldest sanitary organization in Great Britain, and its certificates are, as previously stated, accepted not only in Great Britain, but in many parts of the Empire, so that a person once obtaining a standard may find his opportunity to obtain employment almost anywhere in the Empire. Dr. Starkey, Professor of Hygiene in McGill University, Montreal, is the representative of the Institute in this country, and has already interested many sanitarians in the work which certainly has many features to commend itself to the local Sanitary Authorities of this Province, who should be required to employ inspectors with some qualifications for office other than those at present possessed, and which in too many instances it is feared are more those of a personal favoritism than any other. The colonial centres so far established by the Institute where examinations are conducted by local Sanitary Authorities are, Hong Kong, Cape Town, Sydney, N.S.W., Hobart, Tasmania, Perth, Western Australia, and Montreal.

NECESSITY FOR ADOPTION OF REGULAR LABORATORY EXAMINATION OF ANTI-DIPHTHERITIC SERUM.

With the knowledge gained regarding the prophylactic and curative properties of anti-diphtheretic serum, there has arisen the question how far is the state responsible for the supplying of this biological product in a similar manner to that of vaccine. Section XII of the Public Health Act providing, "It shall be the duty of the Provincial Board of Health to see that a supply of proper vaccine matter is obtainable at all times at such vaccine farms and other places as are subject to inspection by the Board."

The duty of the Board in the case of vaccine is clearly set forth, its powers extend to the oversight of vaccine farms, when situate within the Province, and an implied control over the foreign made article. Just how far this latter control has been exercised in the past it is not my purpose to discuss: for the future it is proposed to conduct bacteriological examinations, from time to time, of vaccine purchased in the open market with a view of ascertaining the freedom of the same from pathogenic organisms. The chief source of supply to the profession and the public has heretofore been from the United States, but recently two of the leading English producers have entered the market, urged on, I am led to believe, by reason of serum being offered in Great Britain by an American firm at cut rates as compared to the prices prevailing there. This fact alone would not greatly affect the question, for in commercial life, with the expansion of trade it is happening every day, but the question becomes complicated by reason of the prices quoted by these English houses, whose reputation is of the best. Prices too that are so greatly at variance with those adopted as a uniform standard by the American firms is shown in the following table:—

Standard Price of American Product.		British Product.	
Quantity		Burroughs & Wellcome Co.	Lister Inst.
500 units	$1.10		
1,000 "	3.00		
2,000 "	3.50		
3,000 "	5.00	....	....
4,000 "	6.50	.50	....
		.80	.60
		....	....
		....	....

and I believe the product of the Pasteur Institute of Paris, France, can be secured for $9.00 per dozen packages of 2,000 units each, but the French standard differs from those quoted above. Of course there is a difference in the method in which the serum is packaged, and the American manufacturers will exchange, while the English producers make a straight sale exchanging, I believe, within one year.

But a seeming dfficulty arises from the fact that the American manufacturers, some of them at least, have in addition to the regular serum which is quoted above, a special line known as Board of Health, which they sell at 75 cents per thousand units; this is marked "Board of Health" and is supposed to be sold only to Boards. One maker informs me that the only difference between the Board of Health and the more expensive article is that of "bulk." To market two separate packages at such a variance in price is of itself, in my opinion, misleading, for apparently it is, in the opinion of the manufacturer, not as good as the best, therefore, its use should be discountenanced for what is wanted in medicine where a life is at stake is the best only, whether it is for the poor man's child or the rich, for in these days often the former becomes of more value to the state than the one fed in the lap of luxury.

Another remarkable feature of this question of price is the fact that one of the American manufacturers is marketing serum in Great Britain at three shillings per 2,000 units in each package of this, however, I am not able to speak authoritatively.

It is further claimed for the American serum that there is no need of the anti-toxin syringe as each package in itself forms one. These, of course, are mere matters of trade competition over which we have no control. They certainly have a bearing in the cost of manufacture for, given, that the returns of the American products are one-third which, I am assured by several manufacturers, is about the yearly average. The cost of manufacture and packing of this quantity must be added to the original cost of the other two-thirds. If, however, the English producers will exchange any time within twelve months, as I understand they will, then they too have to figure upon the "return" loss.

Respecting the relative standing of the several manufacturers they are, in my opinion, from personal knowledge, all in the same high level, the endeavor of each is, I believe, to produce the best biological product that can be made although differing, as previously stated in their methods. One producer, The Lister Institute of Preventative Medicine, must, however, be left out when considering the commercial interests, from the fact that it possesses a very large endowment fund which has been received from various sources from time to time.

Upon the question of the cost of serum to the public as a Board we have nothing at present to do, it is one which will right itself when some system has been adopted whereby the very important, certainly the most important question of all has been determined, namely, the relative merit of standard of all products sold in this Province. For what is required is a serum of maximum potency with a corresponding minimum cost and as a means to secure this end I would recommend that this Board at once begin and systematically carry on a laboratory examination upon the products as purchased in the open market, and publish the results obtained from time to time, for in so doing the public and the medical profession will receive that protection which is its right to demand.

PETITION FOR ESTABLISHMENT OF BRANCH LABORATORIES AT LONDON AND FORT WILLIAM.

Apropos of Laboratory work which is yearly increasing in volume and importance, there are two communications before the Board asking for the appointment of bacteriologists, one in the City of London and one in the Town of Fort William. The situation previous to 1904 was that the Laboratory of the Board carried on both bacteriological and chemical examinations and research work upon public health lines, and incidentally made free examinations for the physicians of the Province of sputum, swabs and blood sepcimens for diagnostic purposes. In this branch of public health work, however, several of the local health authorities of the cities of the Province branched out, and very rightly so, as it is to the interests of each community to provide for the early determination of contagious diseases.

It was not, however, until the date mentioned that any departure was made from that just stated. Early in the year 1904 application was made by the authorities of Queen's University for the appointment of a bacteriologist as assistant to Dr. Amyot, the object being to examine specimens such as those just described. After careful consideration of the question by the Board it was unanimously of the opinion that the request should not be granted, as it was felt that by so doing the usefulness of the Central Laboratory would be greatly curtailed, and that to establish the precedent of assisting local authorities in the maintenance of bacteriological laboratories was a bad one, and if once acquiesced to, other requests would be received from different portions of the Province. As a proof that this was correct we have now to consider the applications just referred to. For the information of the Board I would state that for some time the cities of Toronto and Ottawa have been carrying on just such work as that proposed by London and assisted last year in Kingston, both, however, without state aid.

TORONTO SEWAGE INVESTIGATIONS.

As a result of the conference of the Committee on Sewage, with Dr. Chas. Sheard, M.H.O., of the City of Toronto, report of which was made to the Board at a previous meeting, I am pleased to state that the council of the city have appropriated the sum of $2,000 for the purpose of making regular systematic collection of sewage, at outlets decided upon for a period of one year, the object being to ascertain the true character of the city's sewage by laboratory examination. It is expected in this manner the conclusions, which will ultimately be arrived at by the Committee and this Board, will be greatly enhanced.

ESTABLISHMENT OF A SANITARY MUSEUM.

For some time I have been impressed with the necessity there exists for a permanent Sanitary Museum in connection with this Board, one in which could be gathered in properly arranged sections, specimens or exhibits illustrative of the progress which has been made, and is being made in the many branches of public health work, and with a view to the initiation and carrying on of the work, after a conference with Mr. M. Quinn, Mechanical Inspector of the Department of Public Works, who most cordially and enthusiastically consented to assist in securing plumbing and other specimens, and after conferring with the Hon. The Provincial Secretary and the Minister of Public Works on the subject, I am pleased to state that the scheme met with their hearty approval, and a large room in the basement was kindly set apart for the museum.

A circular was issued by Mr. Quinn appealing to the master plumbers and manufacturing firms, and indicating that we would be pleased to receive specimens and already quite a number of exhibits have been received. I have also received from several of the manufacturers of biological products samples of the output of their laboratories, and the inquiries already received from architects and others fully demonstrate the necessity which exists for just such a collection and the interest which will be taken in the work.

ANNUAL REPORTS OF LOCAL BOARDS.

The Reports of the Local Boards of Health have not yet all been received so that it will be impossible to collate them in time for presentation to the Board at this meeting, but I have much pleasure in submitting those of the following cities:

Belleville.—Under Dr. Yeomans special efforts have been made to carry on a more vigorous campaign against contagious diseases, and the school teachers are stated to be of the greatest assistance in carrying on the work. A small outbreak of smallpox has resulted in the Board securing a hospital tent, which after being carefully disinfected, has been stored away in case of future emergency. The M. H. O. states that a supply of vaccine and anti-diphtheritic toxin is constantly kept in stock for prompt use in those cases where the family is unable to supply its own, and adds, it is the intention to use this at the request of any medical attendant under the direction of the M. H. O.

Regarding milk supply, 64 licenses were issued with a testing of the milk.

The doctor refers to a scheme of filtration of water in terms of approval, and also indicates the need that exists for a proper system of sewage disposal and recommends the securing of accommodation for a city laboratory where this branch of health work can be carried on systematically.

The doctor is certainly to be congratulated on the high sanitary tone of his report.

Hamilton.—As might be expected the Report of the M. H. O. of this city is up to its usual high standard.

Regarding diphtheria, of which there were reported 180 cases with 14 deaths, or a mortality of 7.7 of cases which, as he points out is very low. As an indication of the use that is made of hospital treatment 115 or 63.9 per cent were removed thereto, this being an increase as compared with 1903 of 44 cases treated in hospital. The doctor further demonstrates the advantages of this form of treatment by stating, that of the 115 hospital cases only four died, while of the 65 home cases, 10 died.

The medical practitioners of the city are to be congratulated on the fact that the "serum treatment" is in general use, and also that it is used by them for prophylactic purposes. The M. H. O. points out the great need that at present exists for a contagious disease hospital in which provision could be made for the care of "suspected cases," as by so doing the spread of this class of disease would be greatly lessened. One matter of regret is that fewer cases of scarlet fever were removed to the hospital than in the case of diphtheria; of 218 reported only 56, or 25.6 per cent. were dealt with according to the regulations.

Speaking of the care of tuberculosis it is stated that a "local sanatarium," particularly for advanced cases, is one of the needs of the future.

Regarding the inspection of milk, the M. H. O. advocates prohibiting its sale when of a higher temperature than 50 degrees F., the object being in this manner to prevent the growth of bacteria whose presence is a menace to infantile life.

London.—Reference is made in this report to the decrease in contagious disease, which is attributed to the more rigid enforcement of the law in every particular. As no figures are given of the cases of diphtheria and scarlet fever treated in hospital no comparison can be made.

The local authorities are to be congratulated upon the by-law regulating and controlling the "Ice Supply."

Among the sanitary improvements indicated as being of public necessity is an abattoir, and reference is made to the investigations regarding the adoption of a garbage system with the erection of a crematory.

Report of the Chairman.—Dr. English in his report to the Mayor and Aldermen refers to the following items not covered by the M. H. O.

(*a*) The prosecution of Mr. J. H. McMechan for maintaining a nuisance in the shape of an unsanitary rendering works, which resulted in the abatement of the same.

(*b*) The placing of the contagious disease wards of the Victoria Hospital under the jurisdiction of the M. H. O. with satisfactory results.

(*c*) The appointment of a bacteriologist for the western portion of the Province in the City of London, to be paid by the Provincial authorities.

Ottawa.—Dr. Law's report is short and to the point, he reports a gratifying decrease in contagious diseases—scarlet fever and diphtheria having claimed only 9 victims, as compared to 48 in 1903, and 78 in 1902. He points out the need that exists for a local sanatorium for consumptives, and advances the claims for a civic abattoir, together with the inspection of meat. The following table shows the number of cases notified and treated in the isolation hospitals of the city:

——	Cases notified.	Removed to Hospital.	Deaths.
Diphtheria	114	105	3
Scarlet fever	157	145	2
Smallpox	1	1	0

figures which indicate that over 92 per cent. of all cases of diphtheria and scarlet fever were treated in the City Isolation Hospital, with a case death-rate in the former disease, of 2.6 per cent and in the latter, of 1.2 per cent. The facts fully justify the outlay made by the city authorities some two years ago.

The report of the Sanitary Inspector shows that a large amount of work was done by this branch of the department, and the results as regards contagious diseases warrant the statement that it must have been well done.

St. Catharines.—The Report of the Chairman of the Board who apparently acts as M. H. O., refers to sporadic eruption of choleric diarrhœa which occurred last September, and was attributed to either atmospheric causes, or infected water supply. In this connection it will be remembered that the laboratory reports of Dr. Aymot, made shortly after the outbreak, showed the presence of colon bacilli—which according to the latest English authorities, are called bacilli of indication, and point to a recent pollution of the water.

The Chairman states, "that the Board sincerely trusts that they hope the wealthy and charitable citizens may ere long come to the relief of the people, and furnish means to erect and maintain an isolation hospital for the treatment of contagious diseases." A rather retrograde move I should say, for it is now an established fact that it is the duty of municipalities to provide for the care of all contagious diseases in a municipally constructed and municipally owned hospital, and not carry on health work along lines of a public charity. It might be pointed out that the law requires St. Catharines as a municipality to make this provision.

Stratford.—After dealing with the general work of the year, the M. H. O., urges the council to take into their consideration the great need that exists in the city for the erection of an Isolation Hospital—he also recommends the introduction of a system for garbage collection and disposal.

Windsor.—This city reports a larger number of enteric cases than usual, but the cause is, at the date of making the report, not certain.

In reporting on the 26 dairies inspected, the M. H. O. states, 'that there is much improvement in their conditions over the past year," but adds:—"They are filthy, poorly ventilated, and without proper drainage," and he urges, that license shall be dependent on "certificate of inspection."

Referring to the necessity that exists for a civic laboratory, he says:—"I want you to do everything you can to assist me in the matter, now that we have a municipal building. My idea is to equip a laboratory in which can be made the proper analysis of milk—also bacteriological and microscopical examinations. This could be done at a very little expense and will be only in keeping with the progress of the city is making in other directions. This recommendation is on similar lines to that made by the M. H. O. of Belleville, and they stand out in marked contrast to that made by the Chairman of the London Board—who fails to grasp the responsibility of the municipality in providing for the early diagnosis of contagious diseases, such as can be ascertained by laboratory methods.

Woodstock.—We cannot do better than quote the closing words of the M. H. O's. report, as they clearly set forth the sanitary and other advantages of the city, he says: "We congratulate you on the health and present condition of our city. With an abundant supply of the purest domestic water, unequalled in the Province, with a sewage system, including septic tanks, almost perfect, thereby enabling your officers to insist on the removal of the polluted cesspools, wells and odorous privy vaults, with sidewalks and streets of the best material, beautiful lawns, and sanitary back yards, two hospitals, (general and isolation), well equipped public buildings second to none in the Province Woodstock ought to attract tourists who are in quest of comfort and health."

TABLE A.

Return of Contagious Diseases by Quarters for the Years 1903 and 1904.

	Diseases.	1903.		1904	
		Cases.	Deaths.	Cases.	Deaths.
First Quarter	Smallpox	523	15	192	1
	Scarlatina	1,565	289	865	49
	Diphtheria	933	110	938	143
	Measles	....	15	112	5
	Whooping Cough	....	20	29	29
	Typhoid	185	63	107	59
	Tuberculosis	....	560	564	564
Total		3,201	1,072	2,807	850
Second Quarter	Smallpox	218	4	83	1
	Scarlatina	983	156	425	22
	Diphtheria	599	76	630	93
	Measles	....	21	246	10
	Whooping Cough	....	57	76	19
	Typhoid	147	51	111	67
	Tuberculosis	....	602	660	644
Total		1,947	967	2,231	856
Third Quarter	Smallpox	54	2	29	2
	Scarlatina	390	46	325	25
	Diphtheria	571	90	485	8
	Measles	....	10	30	8
	Whooping Cough	....	34	75	30
	Typhoid	273	87	540	126
	Tuberculosis	....	435	537	512
Total		1,288	704	2,021	761
Fourth Quarter	Smallpox	25	....	5	....
	Scarlatina	739	38	550	33
	Diphtheria	1,491	202	992	144
	Measles	....	9	138	9
	Whooping Cough	....	35	88	12
	Typhoid	407	97	504	145
	Tuberculosis	....	475	462	445
Total		2,662	854	2,739	788
	Total contagious diseases cases and deaths for the year	9,098	3,597	9,798	3,255

TABLE B.

Cases and Deaths for the Year 1904 by months. Average Population Reporting 1,982,443, or 90 per cent., the Death Rate being 12.8 per 1000 per annum.

	Smallpox.		Scarlatina.		Diphtheria.		Measles.		Whooping Cough.		Typhoid.		Tuberculosis.	Deaths from all causes.	Rates per 1,000
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Deaths.		
January	103	0	380	24	382	53	32	2	18	7	39	23	179	2,200	13.1
February	41	1	251	13	289	42	41	1	16	16	18	18	185	2,322	14.4
March	48	0	234	12	267	48	39	2	6	6	50	28	200	2,416	15.1
April	33	0	161	10	169	28	98	7	26	7	29	20	219	2,290	13.7
May	10	0	128	7	204	29	107	2	4	3	42	32	229	2,331	13.7
June	40	1	136	5	257	36	41	1	46	9	40	15	196	1,902	11.2
July	13	1	91	9	149	13	15	4	25	8	65	10	179	1,861	11.4
August	8	0	132	9	172	25	3	1	19	15	293	50	188	2,024	12.4
September	8	1	102	7	164	20	12	3	31	7	182	66	145	1,987	11.8
October	1	0	177	10	239	34	1	1	20	7	265	63	159	2,091	12.0
November	2	0	205	8	316	45	12	1	23	1	171	43	127	1,910	12.0
December	2	0	168	15	437	65	125	7	45	4	68	39	159	2,077	12.7
Total	309	4	2,165	129	3,045	438	526	32	279	90	1,262	397	2,165	25,411	

Laboratory Reports.

By J. A. AMYOT, M.D.

To the Provincial Board of Health of Ontario:

Gentlemen,—I have the honor to report to you as follows on the work done in your laboratory during the last quarter of the year 1904.

Municipalities	Diphtheretic Swabs				Tuberculous Sputa		Typhoid Bloods		Miscell'ous Specimens	Waters		Total Number for Month
	Release		Diagnosis									
	+	—	+	—	+	—	+	—		Chem	Bact.	
October	30	19	41	51	42	81	27	35	3	0	26	355
November	19	39	41	69	44	84	29	63	4	0	60	454
December	14	26	43	95	33	81	18	39	16	0	52	422
	63	84	125	215	119	246	74	137	23	0	138	1,231
	487				365		211		23	138		
	147		340									

To this should be added the number of sewage specimens examined for the City of Toronto, during December, 1904.. 98

Grand Total........................ 1329

Then follows a table showing the number of specimens, and their denomination from the various counties of Ontario, examined.

Report from Laboratory of Provincial Board of Health for qaarter ending December 31st, 1904.

County	Municipalities	Diphtheretic Swabs				Tuberculous Sputa		Typhoid Bloods		Miscell'ous Specimens	Waters		Total Number
		Release		Diagnosis									
		+	—	+	—	+	—	+	—		Chem	Bact.	
Algoma	2											2	2
Brant	4				1	2	3					1	7
Bruce	6				1	3	2		1				7
Carleton	2					1	1					1	3
Dufferin	0												
Elgin	3			2			1						3
Essex	7			5	1	1	8	3	3				21
Frontenac	10	10	32	15	27	20	31	3	7	5		3	153
Grey	9	1	1	1	10	4	9	1				2	29
Haldimand	3				1	1	4		1			1	8
Haliburton	0												
Halton	4	1		2	1		2		1				7
Hastings	8			1	6	6	15	1	3				32
Huron	5			1			2	1	4				8
Kent	5					7	9		2				18
Lambton	6		1	2	2	2	9	1	1	1			19
Lanark	7		1	4	6	2	9	1					23
Leeds and Grenville	8				5	7	15		4			2	33
Lennox and Addington	8			1	1	6	8		1				17
Lincoln	4			5	2	1	2	2	1			8	21
Middlesex	3			1								13	14
Muskoka	4				3	1	2		2				8
Nipissing	5			1		1		2	1			9	14
Norfolk	4					1	1	3				6	11
Northumberland & Durham	9	1	2	1		4	5	7	4				24
Ontario	7				1	1	4		4			1	11
Oxford	5			1		1	9	1		1		10	23
Parry Sound	5		4	2	6		3	4	9			1	29

Report from Laboratory of Provincial Board of Health—*Continued.*

County	Municipalities	Diphtheretic Swabs				Tuberculous Sputa		Typhoid Bloods		Miscell'ous Specimens	Waters		Total Numbers
		Release		Diagnosis									
		–	—	–	—	+	—	–	—		Chem	Bact.	
Peel	2	......	......	2	1	......	1	2	......	......	......	......	6
Perth	5	......	......	......	1	......	......	......	1	......	......	1	3
Peterboro	1	4	4	7	8	5	8	......	1	......	......	1	38
Prescott and Russell	2	......	......	1	2	......	......	......	......	......	......	......	3
Prince Edward	2	......	2	......	1	......	1	......	......	......	......	......	4
Rainy River	7	......	......	......	5	......	1	......	......	2	......	2	10
Renfrew	13	21	14	6	2	5	7	......	4	......	......	......	59
Simcoe	4	4	6	14	18	5	10	12	18	......	......	1	88
Stormont, Dundas & Glengarry	0	......	......	......	1	1	5	......	1	......	......	......	8
Thunder Bay	4	......	......	......	......	......	......	......	......	......	......	......	......
Victoria	7	......	......	2	1	......	......	......	2	1	......	......	6
Waterloo	6	......	....	3	8	......	7	2	1	......	......	2	23
Welland	12	......	......	2	3	2	2	......	1	......	......	......	10
Wellington	2	4	2	9	11	6	22	......	2	......	......	2	58
Wentworth	18	1	1	......	1	2	3	9	13	......	......	2	32
York	1	18	14	39	73	20	25	21	51	13	......	61	335
		65	84	130	210	118	246	76	147	23	......	132	1,231

More municipalities are using the facilities of the laboratory and especially from diphtheria quarantine, notably East Toronto, Toronto Junction, Guelph, Kingston, Wychwood, Bradford, Peterborough and Hamilton.

It is matter of wonder seeing that for diagnosis in three such important diseases as tuberculosis, typhoid and diphtheria, the facilities of the laboratory are free to all practitioners in Ontario, only asking to pay postage on their specimens, that more specimens are not sent. It would show either that our practitioners are too busy, or have got into that state of indifference that is so fatal to advance in medical work.

Work is being pushed along with the examination of consumption cures especially, also a line of work with carbon monoxide, as to its effect on the blood in acute poisoning and in chronic, also as to its action on the tissues.

Medical Inspectors' Reports.

By R. W. BELL, M.D.

Report *re* Smallpox in Township of Hanmer.

Smallpox having been reported north of Sudbury, I, on Nov. 26th, 1904, accompanied by Provincial Constable F. Gagne, visited the Townships of Hanmer and Capreol. At Ivan Charron's in Hanmer, I found his son, Edward, aged 21, and daughter, aged 8, suffering from smallpox. The former in his 19th day was out working in the barnyard, although the temperature was about zero. His face, arms, etc., were a mass of scabs, and pus oozing from under some of them. The constitutional symptoms having subsided, he did not feel sick, and had been out working for nine days. His sister was running about the house, not suffering to any great extent, from a much milder attack. I vaccinated five members of the family who had not previously been vaccinated, after considerable opposition from the father; had the house placarded and ordered that none should leave the premises until the quarantine was raised. I then proceeded to Lalonde's Hotel, where young Charron had been bar-tender prior to his illness, but no other cases having cropped up, and nineteen days having elapsed since Charron had left there I did not think it necessary to quarantine it.

On my return to Sudbury, I requested Dr. Struthers to visit Charron's later, when the disease had abated, to disinfect the house, etc., and raise the quarantine. I also suggested having the hotel disinfected.

Dr. Struthers wrote Dec. 12th, saying he had disinfected the house, from which I infer that no other members of the family had contracted the disease, but Lalonde objected to his hotel being fumigated, and nothing was done to it by Dr. Struthers, although he says he thinks the hotel a danger point. As I had learned that a case or two of smallpox had turned up in Sudbury, about this time from the north country, I feared the hotel was the distributing point, so I wrote Dr. Struthers to insist on disinfecting it, and if the landlord refused to allow it, then to close it up until he submitted, and so the case rests at present. No fresh cases have been reported from that neighborhood, but I fear more may be heard from it, as the settlers have no fear of the disease, and in fact, I believe, conceal attacks of it, and so keep it lurking in the settlement the year round. It may be necessary to punish some of the delinquents if sufficient evidence can be got to convict them and so teach them their duty under the circumstances.

All of which is respectfully submitted,

R. W. Bell,
Medical Inspector.

Toronto, Dec. 20th, 1904.

Report *re* Lumber Camps in New Ontario.

During the months of November and December, while in New Ontario attending the Smallpox outbreaks, I took the opportunity of getting in touch with from 40 to 50 lumber firms or their representatives, to find out in how far they were conforming to the Regulations for Camps in the Unorganized Districts. I covered the territory from North Bay to the Soo and Biscotasing in the west, and the Temiscaming District to the north, also a portion of territory south of Lake Nipissing. It was scarcely possible to visit the camps as wheeling was almost out of the question and there was not enough snow for sleighing, so I had to content myself in most cases with interviewing the lumbermen in their offices, and the physicians in attendance upon the camps.

With some half dozen exceptions I found among the larger operators that the Regulations were fairly well carried out and that they were quite satisfied to assist in every way in their enforcement. The physicans reported the locations and sanitary conditions of the camps in accordance with the requirements of the Act. In a few cases there was negligence in contracting with a physician to attend and inspect the camp, and in one or two instances, I believe, deliberate contempt shown for the Regulations.

In all cases I pointed out the law and the wisdom of complying with the Regulations not only in the interests of the general public, but in those of the lumbermen as well as their employees. The negligent ones have since made the necessary contracts, but two or three still protest against the appointing of a physician. The trouble largely arises through the sale of hospital tickets being pushed early in the season amongst the employees by the owners of private hospitals. The men, later, object to being charged a fee for camp attendance, and the employers do not like to enforce the fee lest the men should leave. Beginning to charge the required fee late in the season causes discontent, the remedy for this being to conform to the Act from the beginning of the season and all act in unison.

At Blind River I found a good system in vogue. From here some half dozen firms operate with a large number of camps, and a hospital at a convenient point is in common use, whilst two physicians under Dr. Burd's supervision devote their whole time to the camps. A similar system with such modifications as may be necessary, I recommend to all other firms as it seems to work satisfactorily for all parties.

In one office I found a very conspicuous notice printed in large type and signed by four firms to the effect that no men would be hired by them excepting those who could produce a certificate of vaccination within a certain date; that those certificates would be retained by the firm while the men remained in their employment, and returned to them on their discharge. This system I also strongly recommended as "Eternal vigilance is the price of safety," and I find there is a tendency to laxity in enforcing the requirements of the Act with regard to vaccination, with the subsidence of the smallpox epidemics.

I might say, however, that perhaps there is a reasonable ground for complaint amongst the camps because of the negligence of some of the contracting physicians, and of the hours at which they sometimes visit the camps, but this is easily remedied by the employers and physicians having a better understanding as to the duties required. I have talked the matter over with most physicians, and endeavored to impress upon them the necessity for faithfully performing their duties, otherwise there will be discontent, and blame is wrongly placed for it on the Act.

The camps this season in the district visited have been singularly free from disease, no smallpox reported from any but one small jobber's camp in Lorraine Township, and which we succeeded in stamping out rapidly, confining it to three cases.

In some of the small jobber's camps where from 8 to 10 or 20 men are employed, and all, men who live in the near locality, going home as a rule on Saturday nights, there is found a difficulty in collecting a fee for a contract physician without discontent, as these men go home in case of illness or injury and employ their own family doctor.

At Wahnapitae I found the headquarters of a large construction gang working on the new C. P. R. line south towards Toronto. 1,600 to 1,800 men are employed over a stretch of about 60 miles, suitable hospital accommodation is provided and three physicians are devoting their whole time to these men.

From my experience in this work I have become more and more convinced each day, as I interviewed the interested parties, that a strict enforcement of the Sanitary Regulations for Unorganized Districts is not only no hardship to any one, but a decided benefit to the individual workmen in the camps as well as to the employers and the general public.

All of which is respectfully submitted,

R. W. Bell,
Medical Inspector.

Toronto, December 31st, 1904.

Report *re* Typhoid Fever in Chester.

Location.—Chester village. High bluff overlooking the Don valley, north of John St. and east of Sarah St.

Area.—Confined to a row of cottages along Sarah St. within an area of about 300 x 150 ft.

Soil, etc.—Clay. Surface very flat with slight slope to the south.

Drainage.—None, except a couple of small trenches recently dug, and leading out to a trench along side of street. Water runs off or soaks away very slowly.

Water Supply.—All obtained from three (3) wells in the infected area, which are supplied from surface water. No springs. Wells 10 to 18 feet deep. Two with wooden pumps, and drip back into well. One with bucket and windlass.

Surroundings.— Privies 30 to 60 ft. from wells and nearly all pits. A cow stable near the centre of the area with 10 head of cattle. Open cesspool at west end of stable, about 15 ft. in diameter and two feet deep, into which all stable manure is dumped, and is only about 60 feet from well. Cows were on pasture since April last, but milked twice daily in yard, and cans washed at adjoining well, except during August, when milked and cans washed in a neighbouring yard beside one of the other wells. Cattle in stable at night during past month and cesspool in constant use.

Conditions and Cases.—First case developed about last week in July, in family of Robt. Hall (who had the cattle), in a girl nine years old. Second and third cases developed early in September in McCormack's house, in Mr. and Mrs. P. M. McCormack who use the yard and well in common with Hall. Fourth case, Mrs. Arnold, about 20th Oct., living at south end of area. Seven more cases developed since Nov. 1st., viz., three in Arnold's, one each in McCartney's and Miller's immediately to the south of Hall's, one in Hall's own house and one in Johnston's to the north. The wells are in Johnston's, Hall's and Arnold's lots. All the cases have been using water from one or other of these wells and all have had their milk supply from Hall's cows. So far eleven cases in this area, viz., three children and seven adults, of whom seven have been treated at home and four sent to hospitals. Four cases supplied with milk from Hall's have been reported in the city since Nov. 12th inst.

Enquiries show that the urine and evacuations from the bowels of the patients treated at home, after being mixed with sol. carbolic acid have been emptied into the cesspool at cow stable or emptied on the ground in back corners of the yards.

No milk has been sold to customers since 20th inst.

Remarks.—Origin of the first case unknown, but child had been attending school, a few hundred yards to the northeast. On enquiry could not learn of any other cases in the school. All indications point to the cases subsequent to the first one in July, arising from contamination of the water supply and through it the milk. Hall's well is said to have been quite recently cleaned, and two of the pit closets have been removed to a greater distance from the well.

Samples of water from all three wells are submitted for examination, and until reported on, nothing more definite can be stated. Stoppage of sale of milk, and avoidance of use of water from the wells has been advised in the meantime.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector.

Provincial Board of Health, Toronto, Ont.

Laboratoy of the Provincial Board of Health, Toronto, November 28, 1904.

Report on waters sent in by Dr. R. W. Bell, Inspector Provincial Board of Health, from cor. Winchester and Broadview Ave., on Nov. 28, 1904. Analyses were begun next.

Laboratory Numbers.	Sender's Numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon Bacilli	Colonoid Bacilli.	Chlorine in parts per million.
3455	x 14	Wm. Johnson's well	none	none	present	none	79
3455	x 24	Robt. Hill's well	none	none	present	none	152
3456	x 20	Geo. Arnold's well	none	none	present	none	214

All of these waters show chemical pollution and also infection with pathogenic basteria and are unsafe to drink.

John A. Amyot.

Report *re* Smallpox in Township of Lorraine.

In accordance with instructions in a telegram received at Sault Ste. Marie from your Secretary on Dec. 3rd inst., I hastened to Haileybury, which I reached on evening of 5th inst. to investigate an outbreak of smallpox reported from there. Next day I drove out four miles into the Township of Lorraine to a lumber jobbers' small camp of six men, two of whom had their families with them. All had come from Gigues the Quebec side of Lake Temiskaming, where, current report said, smallpox was almost continually lurking. The foreman, Albert Marchand, of this camp was the victim of the disease and had been into Haileybury several days previous, where Dr. Codd had pronounced his case smallpox, and he had been driven back to his camp by the citizens. He, at the time of my visit, was away in the woods at work, but was reported as nearly well by one of his men. He occupied with his wife and five children a small log cabin about

10 x 14 feet, badly lighted and no ventilation. Three of the children showed good marks of vaccination, but the other two I vaccinated although the smallpox rash was in evidence on one of them. Near by in another cabin I found two women, one of whom I vaccinated, but the other fearing the operation escaped to the woods while I was engaged. All others were reported within two years, being vaccinated except a boy who also took to the woods on my first arrival.

I placed a constable on guard in a cabin a short distance away to watch the camp and prevent communication with the outside world except through him or Dr. Codd who I instructed to take charge of the cases. Dr. Codd has since reported (Dec. 24th), that the woman who fled to the woods, developed smallpox immediately after my visit. He reports vaccinating four men and the boy, also that no further cases developed, and he had disinfected the camp and raised the quarantine.

A statement, with request for payment of the expense, connected with stamping out this outbreak, amounting to sixty-one dollars, has been sent to J. R. Booth, lumberman, Ottawa, for whom this jobber was working.

All of which is respectfully submitted.

R. W. Bell,
Toronto, Dec. 30th, 1904. *Medical Inspector.*

Report *re* Supposed Case of Smallpox in Township of Raleigh, in Co. of Kent

On Dec. 22nd, 1904, on the suggestion of your Secretary I visited Merlin, in the County of Kent, to enquire into an "obscure case of smallpox" which had been reported from there some little time before. I found the case was that of a young woman residing in the Township of Raleigh, about ten miles distant and nearer Chatham. She had been visited by a physician from each place, and there was a divergence of opinion between them, one thinking it a case of smallpox and the other chickenpox. As at the time of my visit she was reported recovered and all rash had disappeared, and she had been into Chatham to the doctor's office some days before, I did not deem it necessary to go to see her. None of the other inmates of her residence had contracted the disease, but as the weight of evidence pointed to smallpox I urged that the members of the household be all vaccinated and the house disinfected. Nothing further having been heard of the case, I expect the measures taken have been efficient, and no spread of the disease has occurred.

I learned that there had been undoubted cases of smallpox in the adjoining localities somewhat recently, but owing to the active measures of the attending physicians and board of health, the disease has been kept from spreading to any extent.

All of which is respectfully submitted.

R. W. Bell.
December 31st, 1904. *Medical Inspector.*

Reports of Committees.

Report No. 1 (1905) Committee on Water Supplies on the Simcoe Report.

To the Chairman and Members of the Provincial Board of Health of Ontario.

GENTLEMEN :—Your committee have considered the report made by the Secretary and Dr. Amyot, on the various sources from which the town of Simcoe could secure a suitable water supply.

And would recommend that the Board transmit the same, together with the recommendations contained therein to the Mayor and Corporation of Simcoe.

All of which is respectfully submitted.

W. J. DOUGLAS,
R. P. BOUCHER,
CHAS. A. HODGETTS.

Report on the Source of Water Supply for the Town of Simcoe.

By Dr. C. A. HODGETTS and J. A. AMYOT.

In compliance with a request made by the local authorities of the town of Simcoe, who have in contemplation the installing of a system of public water supply, an examination into the probable sources from which a supply could be obtained, was made in company with a committee of the corporation.

The two creeks close to the town were examined for some distance along the course, particularly the creek from which the canning factory derives its supply. The character of the banks was very similar to many streams in the Province, the current being rapid the whole of the distance travelled, nearly one and a half miles. We also examined the premises of the House of Refuge, situated on property some distance further up, and found that the sewage from this institution was disposed in such a manner as to be a constant menace to the purity of the water—although it will be seen by reference to the loboratory report, that specimen 3,515—taken from the stream at the rear of this institution, showed the water to be free from pollution— at a point close to the town—one of the factories draws its water supply, endeavouring to purify the same by passing that required through an improvised sand filter—the effect of this filter is shown in comparing specimens 3,516 and 3,517— and are an indication of what a properly constructed filter might be expected to do, should it ultimately be decided to use this water as the source of supply for the town.

Patterson Creek is farther from the town, and its waters run into Sutton's pond—the examinations, 3,518 and 3,519, show that both waters were free from pollution, and the quantity of chlorine present was the minimum.

As there are several flowing springs situate on private property on the opposite side of the bank of the stream upon which the town is situated, they were visited, and a report upon two of them appears in the report—

London Water System. No. 1—Pond East of Pump House.

London Water System. No. 2—Pump House and Pond to the West.

viz.:—3,520, 3,521 and 3,522, gives an idea of the purity of the stream close to the town—3,522.

An enquiry was made regarding the ultimate introduction of a sewage system, and the possibility for its discharge, treatment and disposal, at a point in the direction taken by the stream.

From our observations, from the satisfactory results of the examinations made of the waters of the streams from which a supply of water could be obtained, we are of the opinion that those of either of the two creeks would provide ample supply for the town, although no accurate measurement of the daily flow is at present forthcoming. Owing, however, to the possibility which must at all times exist of pollution from the farms contiguous to the streams at different points in the course, and the impossibility of preventing cattle pasturing in the immediate vicinity, it will be an essential that provision must be made for the filtration of the water, preferably by means of slow sand filtration.

We would therefore recommend to the Council of Simcoe, that the services of an engineer be engaged to report upon the cost of, and draw up the plans of a system looking for its supply from either of these two creeks.

Report on the Outbreak of Enteric Fever in the City of London

And Examination of the Water Supply and Sewage Disposal Plant of that City

By CHAS. A. HODGETTS, M.D., and JOHN A. AMYOT, M.B.

Preliminary Enquiry.—Having observed in the public press statements regarding the outbreak of enteric fever in the City of London, which it was claimed by the Local Health Authorities was due to the drinking of polluted well water by inhabitants of the city while on a visit to the nearby summer resort of Port Stanley, and in reply to letters of enquiry written to the authorities of both the municipalities mentioned, as well as those of St. Thomas, the following reports were received, see appendices A. B. and C.

From these reports it is found that there were reported in each of these municipalities the following cases:—

Municipality.	Population.	Cases.	Deaths	Case Rate per 10,000 of Population.
London	37,983	142	9	37.3
St. Thomas	11,485	8	0	6.9
Port Stanley	552	2	0	36.2

As the reports give the opinion of the Local Health Authorities, they will not be any further referred to except to point out that the first case at Port Stanley occurred on July 20th, 1904, the patient being the daughter of the proprietor of the "Fraser House," who had been in attendance at school in the City of London up to July 1st, or nineteen days previously, the second and last case in the village happened on August 18th, the patient having been an employee of the "Fraser House."

London Water System. No. 3—Pond showing water flowing from iron pipes.

London Water System. No. 4—The Reservoir.

It will be noted that the only cases of enteric fever reported in London from January to August, were, one in the month of February, and three in June, and that the first case thereafter was on August 2nd, when the first three cases of the outbreak were reported, from which time on cases were reported at intervals of every two or three days. In the report of Dr. English it is stated that most of the cases are traced to date of July 20th, when three of the city churches held picnics at Port Stanley, which corresponds with the date given by the M. H. O., of Port Stanley, as that upon which he was called to attend the first case in that village at the "Fraser House."

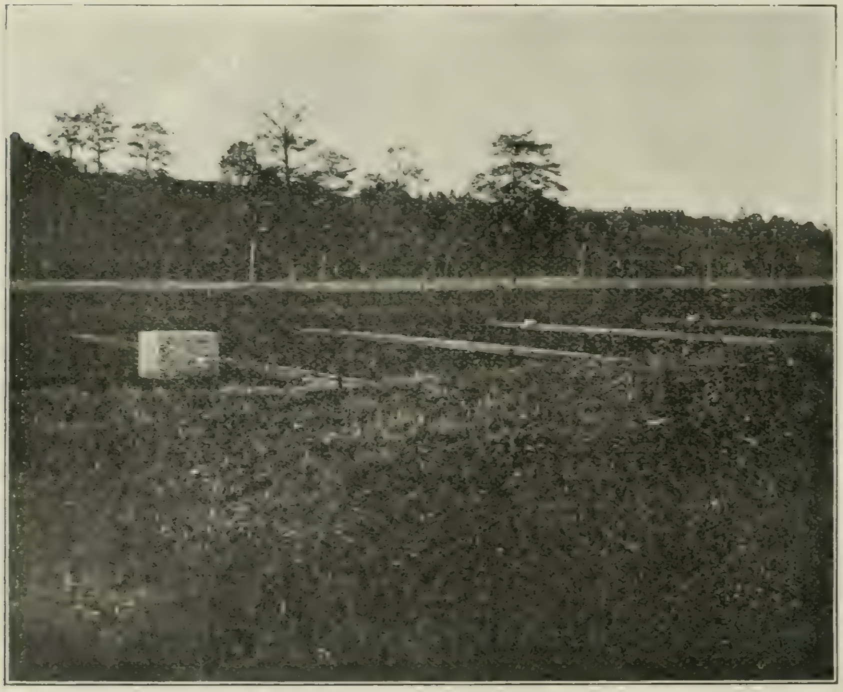
Now, if it is conceded that the outbreak in London owes its origin to the infected "Fraser House" well, and that the infection to the greater number of cases 107—could be traced to drinking of this water on July 20th then, as the incubation period of the disease is as stated by Dr. J. Dreschfeld in writing about enteric fever in Allbutt's System of Medicine,—"in most cases "to be about fourteen days; in some cases however, it has been ascertained "to be as short as four or five days, or even shorter, in others it may be "extend over three or four weeks,"—a statement which is concurred in by all medical authorities, it would appear that the majority of the cases would have happened on or before August 4th, but the statement of the London authorities shows that only three cases were reported up to that date; and allowing an extension of the period of incubation to the maximum of four weeks, it is found that only 65 cases or 45 per cent. were reported to August 18th, and the remainder 77, or 55 per cent., being reported at different dates, from Aug. 20th to Sept. 29th, a fact which in our opinion clearly demonstrates the absurdity of the inference made by the London authorities, that the majority of the sufferers contracted the disease by drinking of the "Fraser House" well water on July 20th.

Again in considering the question of the relative difference in the number of cases reported from St. Thomas and Port Stanley, we have very nearly the same case rate per ten thousand of population, as shown by both Port Stanley and London, although in the former municipality the two cases happened the one in July, and the other in the month of August, at an interval of some four weeks. The case incident in St. Thomas is very much smaller, notwithstanding the fact that the Report received from the Pere Marquette Railroad Company, see Exhibit "D," shows that relatively speaking, more persons travelled from the latter city to the lake shore, than from London—indeed the figures would indicate that every person in London made 1.77 trips, against 2.31 made by the inhabitants of St. Thomas; and notwithstanding this increased incident of exposure, the case incident is nearly six times less, and the total mortality nil, as compared to nine in London.

Consideration—Bacteriological Reports of Water.

Port Stanley Specimens.—In further studying the question we have to consider the laboratory reports of the bacteriological examinations made of the specimens of water received on August 22nd (E) and Aug 29th, (F—the for mer sent by Dr. English, acting M.H.O., of London, and the latter sent by Dr. Mothersill, M.H.O., of Port Stanley, also those lettered "G" and "H"—of the eleven samples of water from Port Stanley reported in "E"—five show the presence of colon bacilli and three a colonoid bacilli —and the two which show neither of these forms of bacilli, contain chlorine considerably in excess of the normal—hence it may be said, speaking generally, all eleven specimens are unfit for domestic use from one cause or the

London Water System. No. 5—Showing the Wells and Pump House.



London. No. 6—Contact Beds, showing Coke removed.

other. It will be noted with pleasure by the travelling public that the sample taken from the tap in the waiting-room of the Grand Trunk Station on August 12th, 1904, was as good as a water could be from a bacterial standpoint at least." The examination made of the twelve samples sent Aug. 29th, by Dr. Mothersill, shows that specimens, 1, 7 and 8—are pretty much the same as in Appendix "E"—the water taken from ten wells was unsafe to use, and the other two were of doubtful character, from the fact of colon bacilli being present. We here find as bad a condition of affairs regarding well water, as one would wish to find in a village of a little more than five hundred persons—but nothwithstanding the fact only two cases of enteric fever were reported.

St. Thomas Specimens.—On September 13th. six samples of water were received from St. Thomas—see Appendix "G"—all the samples being from the city supply, which is taken from Kettle Creek, and subsequently passed hrough a mechanical filter—of the filtered specimens only one shows a suspicious organism—and as the amount of chlorine is below the normal, it may be said the supply at the time the sample was taken, was fairly good.

London Specimens—Appendix "H" states that the result of examination of specimens sent from London by the M.H.O., of the six—two show the presence of colon bacilli—and one that of colonoid bacilli—it will be noted that both the specimens from the wells—(See illustration No. 5)—from which the water is pumped to the reservoir, show the presence of bacilli—the west well, "colon" and the east well "colonoid." The other infected specimen was taken from one of the ponds to west of the pump house, while the water in the other three ponds was free from pollution. In all six specimens, the amount of chlorine present was below the standard.

Examination of Ice Supply.—Regarding this important household necessity, samples of water and ice were examined—Appendix "I"—and the Health Officer in his report for 1904, states, referring to the bacteriologist —"His report showed that the ice from the cove, from the north and south branches of the Thames, Clair and Walker's ponds, was unfit for domestic use in any form." Yet it might be assumed that some of this ice was used during the summer months of 1904 for that very purpose by the London inhabitants.

Result of Inspection of London Sewage Contact Beds.—In the spring of 1904, your Secretary having occasion to be in London, visited the contact beds in company with Dr. English, when it was found that the coke for some depth had been removed by the corporation (see illustration No. 6), and that the raw sewage was being run direct in the river Thames and that this condition of affairs had existed since the winter of 1902-3. On the day of the visit some tramps had started a fire in the far end of the westerly bed, which had been extinguished by running in raw sewage, and it was noted that close by were the entrails of a fowl. On September 25th, 1904, a visit was made to these beds by both your reporters, and the beds were found in the same condition—indeed, the dried entrails and ashes were still there, indicating that the beds had not been used all summer. On examining the river the outlet of the sewage was readily found by the disturbance of the river water at a distance a little above the site of the contact beds, and in following the river down, the septic action was noticeable along the shore in places where the current was retarded. A similar condition, though lesser in degree was observed at other points further up and down the stream. We found the beds had not been replenished with coke, and indeed they were unfit for service.

Inspection of London Water System.—On Sept. 24th we inspected the water system, visiting the pump house reservoir, dam and collecting ponds, being kindly shown over the system by the engineer in charge. We found the dam undergoing considerable repair, as the spring freshet had washed a portion of it away, and partly as a result of this and as a blocking of the river with ice, the river had risen to a considerable height immediately below the dam, and flooded over the tops of the two wells situated below the pump house, as also into one or two of the lower ponds—of this there was every evidence as shown by the water marks on the tree—See photo. No. 5, and this was corroborated by the engineer. This officer further informed us that there were five collecting pools in all—one of which was situated across the river, but of this pool we could gain no further information, either on this occasion or at the time of our second visit. Our examination of the wells showed that the portions in evidence were not as closely connected as they should be, the cement being loose in places.

We found several of the ponds full of water, and during the inspection the method of running from one to the other was demonstrated at the pond shown in No. 2. A wooden retaining wall was in use, as apparently some work of enlargement was going on, and this was still in place at the time of our second visit—the relative situation of some of these ponds, the closets and driving sheds, and driveways above, we found to be such that there is every reason to believe that contamination may take place, both from surface washing and sub-soil infiltration, especially after heavy rains.

Again on the 16th day of October the inspection was repeated in company with Drs. English and Hutchison, upon which occasion the photographs were taken—the situation was practically the same, with the exception that the dam had been repaired.

After a careful study of the data submitted, and from the results of our personal examinations of the London Water System and the method of the disposal of the sewage, we are of the opinion that the outbreak of typhoid is not of the type which we would naturally expect from the infection of a large number of persons at one given date—namely, July 20th, but rather partakes of that characteristic of an outbreak due to pollution of a water supply from time to time, at short intervals of time. As to the possibility of this happening to the London supply, there is every reason to judge that this was possible, from the report of the examination made of the waters, as shown in Exhibit "H"—and which it is more than probable could be caused by the manner in which the closets and driving sheds and driveways are situated, and also, there is in our opinion reason to believe that the wells into which all the water flows before being pumped to the reservoir, are in a leaky condition, and the danger is further increased from the fact that they are situated close to the edge of the river, which river bed must be the abode of more or less sewage and sewage sludge. Again, the fact that the examination of the ice used for domestic purposes was on the whole unsatisfactory, and might be a factor in the cause of the outbreak, must not be lost sight of.

In conclusion we are of the opinion that while the wells of Port Stanley are unfit for domestic use and should be condemned, yet sufficient proof has not been adduced to show that they were the cause of the London outbreak. There is every reason to believe that the London water supply is not free from suspicion, that it was not only a factor, but may at times have been the cause of many of the cases reported. And further, we are of the opinion that measures should be taken to prevent the continuance of the present method of the disposal of the sewage—and as a permanent protection to the inhabitants against pollution of the water supply, there should be established a system of purification by the method of sand filtration, otherwise there must ever exist the danger of contamination if Springbank is to be continued as a public park.

All of which is respectfully submitted.

(Signed).

CHAS. A. HODGETTS, M.D.,
JOHN A. AMYOT, M.B.

Appendices to London Report.

APPENDIX "A."

LONDON, ONT., Oct. 25th, 1904.

DR. C. A. HODGETTS,
Secretary Provincial Board of Health, Toronto.

DEAR DOCTOR,—Yours of the 11th inst., duly received.

We had within the city in August 119 cases of typhoid fever; in September 20 cases of typhoid fever; in October (to date) 3 cases of typhoid fever; total of 142. reported to the Health Office, and considerable trouble was experienced in getting physicians to report, owing to want of knowledge of the existing regulations.

In fourteen of the cases *well* water was used and in the remainder *city* water.

There were thirteen families in which *two* cases appeared, generally within twenty-four or forty-eight hours of one another.

There were in London West ten cases, three of which were directly traceable to Port Stanley infection; one case in each instance was reported from infection at Thamesford (a young physician), St. Thomas, Pittsburg, Penn., Toronto, Hamilton and a railway brakeman running between London and Toronto.

Of these 142 cases 107 I traced directly to Port Stanley infection, and as far as one can judge from statements made by patients to one well only, *i. e.*, the one directly west of the Fraser House Hotel.

There have been nine deaths and all of these were of Port Stanley infection

The majority of the sufferers attended Sunday School picnics at Port Stanley on July 20th, held by the Wellington Street Methodist Church, St. John's the Evangelist Church (Anglican), and the Baptist (Calvin) Church.

Five of the cases occurred among the inmates and employees of the hotel.

The well referred to was sixteen feet deep, bricked up, with a wooden pump and single plank top, with spaces between the boards. According to the reports given at a meeting with the Port Stanley Board of Health, the water supply of the well was derived from a spring, the rain waters from the roof and slop waters thrown upon the roof of the first storey adjoining shed.

The hotel building was in a most insanitary condition. The cellars were wet, and stepping boards had to be used to get about, when I visited early in August, and beneath the bar (an adjunct) a similar condition existed.

The kitchen sinks and drainage were in bad condition, but the single water closet and bath on the first floor appeared to be in good order.

Of the nine deaths that have occurred infection in each case was traced to Port Stanley.

Trusting that this may afford the information you desire,

I am, yours truly,

W. M. ENGLISH,

Chairman Board of Health and Acting M. H. O. during Aug., '04

LONDON, ONT., Nov. 8th, 1904.

DEAR DOCTOR,—Replying to yours of Oct. 28th, I must first apologize for delay caused by my being busy in election matters.

I enclose the list you suggest, and am obliged to you for the interest you have taken in making the report as complete as possible.

Sincerely yours,

W. M. ENGLISH.

DR. C. A. HODGETTS,
Secretary, Provincial Board of Health,
Toronto.

Cases reported to the London Board of Health of Typhoid Fever during 1904.

January	...
February	1
March	...
April	...
May	...
June	3
July	...
August (2 from outside the city)	121
September	20
October	5

Daily Reports for August and September were as follows:

	Cases.
August 2	3
" 5	1
" 8	13
" 10	4
" 15	20
" 16	16
" 17	8
" 20	11
" 22	9
" 23	6
" 24	10
" 25	2
" 26	6
" 27	2
" 29	3
" 30	1
" 31	3
September 1	4
" 2	1
" 7	1
" 12	3
" 16	4
" 17	3
" 20	1
" 22	1
" 26	1
" 29	1

APPENDIX "B."

St. Thomas, August 24, 1904.

Dr. C. A. Hodgetts:

Dear Sir.—We have eight cases of typhoid fever in the city; four contracted at the Fraser House, Port Stanley, from drinking polluted water. The well has since been filled up. Three of the others drank well water, and one contracted the disease before coming here.

We have been building a new dam so as to hold a larger amount of water, consequently I sent you a sample in a sterilized bottle, packed in ice, for analysis. Please give it your earliest attention, and oblige,

Your obedient servant,

Wm. C. Van Buskirk,

Medical Health Officer, St. Thomas.

St. Thomas, Sept. 4, 1904.

Dr. Hodgetts:

Dear Sir,—Since writing to you last we have had no increase of typhoid fever, nor any deaths from it. The first cases have convalesced. The city is in a healthy condition. We have not received a report of analysis of our city water. Hoping you will have time to attend to it soon,

I remain, dear Sir,
Yours truly,
Wm C. Van Buskirk, M. D.,
Medical Health Officer.

APPENDIX "C."

Port Stanley, Oct. 13th, 1904.

Dear Doctor,—Your favor of the 12th received *re* typhoid fever outbreak in the City of London. The alleged source is said to be Port Stanley.

There has not been a case of typhoid fever in Port Stanley for twelve years whose source of infection can be traced to drinking well water prior to July 20th of this year. On that date I was called in to see a daughter of H. M. Douglas, the proprietor of Fraser House. She had then been feeling poorly for a week. My diagnosis was typhoid fever. She was next day removed to London Hospital. The girl was attending school in London up to July 1st.

On August 8th, in company of Dr. English, visited the Fraser House and took samples of water, and by chemical analysis found animal matter in the well, which upon close examination found it be half well and half cistern, having rainfall off roof of Fraser House. I immediately closed such well up. The guests and family were using that water for drinking purposes.

On August 14th, a girl living down in the village was taken ill. She worked at Fraser House. That was the only case.

As far as I can judge the only well from which any typhoid can be traced is the one at Fraser House. That well has been filled up. I took samples of water from twenty-four wells and sent to Dr. Amyot for analysis, and have ordered them to be thoroughly cleaned and made so that no surface water can enter. All wells in the village will be attended to before the first day of May next.

It seems that the health authorities of the City of London are unjustly laying the whole blame of typhoid fever epidemic on Port Stanley. While they dump all the sewerage into the River Thames, confining it by a dam at Springbank, on which a great number of the people spend hours boating, while others go in bathing.

And the ice supply taken from a sewer polluted river.

Should you be in London to meet the Board of Health, then I will be pleased to attend and give any information which you may require.

Any further information that you would require I will be pleased to give if I am able to do so.

Again I may state that only one case of typhoid fever among inhabitants of Port Stanley in a year is not a bad record. We only claim one case as Douglas' child no doubt contracted disease in London.

I suppose the people of Port Stanley are immune, as the health authorities of London state.

Yours truly,
L. T. Mothersill, M.D.

APPENDIX "D."

Pere Marquette Railroad Company,
Office of General Manager,
Detroit, Mich., October 19th, 1904.

Dr. Chas. A. Hodgetts,
Provincial Board of Health,
Toronto, Ont.

Dear Sir,—As requested in your favor of October 12th, I have pleasure in quoting below, the number of passengers carried from London and St. Thomas to Port

Stanley, by this company, during the months of June, July and August, 1904, which I hope, will give you the information desired.

Month.	London.	St. Thomas.
June	2,947	1,977
July	41,491	14,494
August	23,116	10,063
Totals	67,554	26,534

Yours truly,

Wm. Cotter,
General Manager.

Laboratory of the Provincial Board of Health of Ontario.

APPENDIX I

Report on Analysis of Water Sample No. 1.

Lab. No. 1,815.
From Dr. Hutchinson, London.
Toronto, June 22nd, 1904.

CHEMICAL, ETC.

How received (express, messenger or personally collected)—express.
From whom received—Dr. Hutchinson. Address—London.
In what condition received—good. On ice or not—no.
When collected—June 19th. By whom—T. V. Hutchinson.
Analysis begun—June 19th, 1904.

FINDINGS.

Turbidity (permanent opacity)—none. (Microscopic character. etc., of opate and quantity.

Color—yellow.

Albuminoid ammonia—.33 parts per one million.

Free ammonia—.085 parts per one million.

Oxygen consumed—9.7 parts per one million.

Chlorine—2 parts per one million.

Remarks—from pond mills.

Geo. G. Nasmith.

Analyses of Waters From Dr. Hutchinson, London

Other Pathogenic Bacteria than colon B.	Color B.	No.	Free N. H.3	Alb. N. H.3	Ox. Con.	Chlorine.	Nitrite and Nitrites.	Remarks.
....	....	1 237	.05	.415	....	1	....	Pond mills
....	....	3 238	.47	.71	....	1	....	Walker's Pond
....	....	4 239	.03	.115	....	1	....	Melted ice Dam
....	....	5 240	6.6	.23	....	1	....	Melted ice Dexter's Dam

Geo. G. Nasmith.
John A. Amyot.

Laboratory of the Provincial Board of Health,

Toronto, Nov. 28th, 1904.

Report on waters received from Dr. Hutchinson of London on Nov. 18th and 24th, 1904. Analysis were begun on these days, respectively.

Laboratory Numbers.	Sender's Numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon Bacilli.	Colonoid Bacilli.	Chlorine in parts per million.
3408	No. 1	Ox Bow Creek	none	none	none	none	2
3409	No. 2	Crow Creek	none	none	none	none	2
3410	No. 3	North Branch Thames	none	none	none	none	5
3411	No. 4	South Branch Thames	none	none	none	none	14
3471	13	Pond 2—Walkers	none	none	present	none	....
3472	42	Pond 1—Walkers	none	none	present	none	....

The last two met with accident so did not do chlorines of them.

John A. Amyot.

APPENDIX "E"

Laboratory of the Provincial Board of Health,

Toronto, Aug. 22nd, 1904.

Report on waters sent by Dr. English of London and received by us on Aug. 12th, 1904. Analyses were begun on the same day.

Laboratory Numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon bacilli.	Colonoid bacilli.	Chlorine in parts per million.	Remarks.
2419	1. Russell House, Port Stanley.	none	none	Present	none	34	
2420	2. Franklin House, Port Stanley.	none	none	Present	none	26	
2421	3. Belle Cafe, Port Stanley.	none	none	none	none	78	
2422	4. Cement tanks Picnic Grounds, Port Stanley.	none	none	Present	none	8	
2423	5. Well on Lake Shore supplying tanks, Port Stanley.	none	none	Present.	none	6	
2424	6. Bar-Room Fraser House, Port Stanley.	none	none	none	Present	8	
2425	7. Fraser House well, Port Stanley.	none	none	Present.	none	110	
2426	8. Fraser House Stable spring, Port Stanley.	none	none	Present.	none	66	

Report of waters sent by Dr. English of London.—*Continued.*

Laboratory Numbers.	Where collected from.	Streptococci.	Staphylococci	Colon bacilli.	Colonoid bacilli.	Chlorine in parts per million.	Remarks.
2427	9. Spring Erie Rest near the Detroit, Port Stanley.	none	none	none	Present	6	
2428	10. Hazel Hunt. Port Stanley.	none	none	none	Present	1	
2429	11. Hotel Loney, Port Stanley.	none	none	none	none	40	
2430	12. Tap in waiting-room G. T. R., London.	none	none	none	none	1	

Nos. 2419, 2420, 2421, 2425, 2426 and 2429 show chlorine increased considerably above the normal (8) for the district, and therefore probably seepage from the surroundings. These all make good medium for bacteria of a disease-producing kind to grow in. Of them Nos. 2419, 2420, 2425, 2426 show infection already with colon bacilli, intestinal bacteria, and are such waters as in our experience are frequently connected with typhoid fever outbreaks. These four waters are unfit to drink.

Nos. 2422, 2423, do not show seepage, but are infected with these same intestinal bacteria and should be regarded with decided suspicion.

Nos. 2424, 2427 and 2428 are infected with a form of bacteria nearly allied to the colon bacillus and should be regarded with suspicion.

The tap water from the waiting-room of the G.T.R. station, London, is as good as a water could be from a bacterial standpoint at least.

APPENDIX "F"

LABORATORY OF THE PROVINCIAL BOARD OF HEALTH.
Toronto, Sept. 3rd, 1904.

Report on waters sent by Dr. Mothersil of Port Stanley and received by us Aug. 29th, 1904. Analyses were begun on the same day.

Laboratory Numbers.	Sender's Numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon Bacilli.	Colonoid Bacilli.	Chlorine in parts per million.	Remarks.
2601	1	Russell House.	none	none	present	none	32	Unsafe
2602	2	C. Cromwell.	none	none	present	none	48	Unsafe
2603	3	Hill Crest Tank.	none	none	present	none	9	Unsafe
2604	4	M. Payne.	none	none	present	none	21	Unsafe
2605	5	Mrs. Brown.	none	none	present	none	4	Doubtful
2606	6	Wm. Stanton.	none	none	present	none	21	Unsafe
2607	7	Franklin House.	none	none	present	none	27	Unsafe
2608	8	Loney Hotel.	none	none	none	present	43	Unsafe
2609	9	W. A. Day.	none	none	present	none	36	Unsafe
2610	10	Mrs. Taylor.	none	none	none	present	22	Unsafe
2611	11	John Howe.	none	none	present	none	16	Unsafe
2612	12	Alex. Taylor.	none	none	present	none	11	Doubtful

All of those waters marked "unsafe" in the "Remark" column show infection with intestinal bacteria and also increase of chlorine above their normal standard. They show entrance of animal pollution. Those marked doubtful are simply infected, but show practically no pollution.

JOHN A. AMYOT.

APPENDIX "G."

LABORATORY OF THE PROVINCIAL BOARD OF HEALTH,
Toronto, Sept. 26th, 1904.

Report on water sent by Dr. Van Buskirk of St. Thomas and received by us on Seqt. 13th, 1904. Analyses were begun on the same day.

Laboratory Numbers.	Sender's Number.	Where collected from.	Streptococci.	Staphylococci.	Colon Bacilli.	Colonoid Bacilli.	Chlorine in parts per million.
2743	27	Reservoir.	present	none	present	none	7
2744	23	Well at pumping station.	none	none	present	none	4
2745	47	Tap at pumping station after filtration.	none	none	none	none	4
2746	21	Tap at City Hall.	none	none	none	present	3
2747	56	Tap at Fire Hall.	none	none	none	none	3
2748	4	Private residence, 43 Elizabeth St.	none	none	none	none	4

Only one of the filtered waters here shows a suspicious organism, the rest are all right. This is about as good a result as a mechanical filter will give.

JOHN A. AMYOT.

APPENDIX "H"

LABORATORY OF THE PROVINCIAL BOARD OF HEALTH.
Toronto, Nov. 4th, 1904.

Report on waters received from Dr. Hutchinson of London on Oct. 29th, 1904. Analyses were begun on same day.

Laboratory Numbers.	Sender's Numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon Bacilli.	Colonoid Bacilli	Chlorine in parts per million
3208	59	West well.	none	none	Present.	none	4
3209	14	Extreme Western Pond.	none	none	none	none	5
3210	41		none	none	none	none	4
3211	42	Pond immediately west of pump house.	none	none	Present	none	4
3212	11	Well on River bank below pump house.	none	none	none	Present.	4
3213	38	Pond east of pump house.	none	none	none	none	5

Two of these waters show colon bacilli and one colonoid bacilli, organisms very nearly allied to colon bacilli. There is infection into the system somewhere.

JOHN A. AMYOT.

Report on the Columbus, Ohio, Sewage Testing Station.

By CHAS. A. HODGETTS, M.D., and JOHN A. AMYOT, M.B.

The City of Columbus, which is the capital of the State of Ohio, with a popuIation of 150,000—having by vote appropriated the sum of $1,200,000—for the improvement of the Sewerage System, very wisely set apart the sum of $46,000 for the construction and operation for a period of one year, of a testing station. The reason as stated by Mr. R. Winthorp Pratt, Engineer of the Ohio State Board of Health, for this preliminary expenditure, "is to determine, by actual tests on a sufficiently large scale, the best and most economical design for sewage purification works adapted for Columbus Sewage with its special characteristics, and to be built under Columbus conditions as regards topography, design of sewer system, site for purification works, flow of Scioto River, price and available quantity of materials and other factors".

The station was constructed at a cost of a little over $20,000.00, and began operations in August, under the direct charge of Mr. George A. Johnson, Engineer in charge; Mr. A. Elliott Kimberly, chemist; Mr. Wm. R. Copeland, Bacteriologist; and Mr. Geo. P. Shute, Assistant Engineer, associated under whom there is a staff of nine assistants. It is situated on the southern outskirts of the city, at a point convenient to tap the present main intercepting sewer, from which the sewage tested is taken,. An electrically driven centrifugal pump placed in this sewer raises 350,000 gallons per day to the station.

The general arrangement of the buildings permits of ready access to all parts. These consist of laboratory fully equipped, seven tanks, and thirty-five filters, arranged in three sets, each of which has a properly arranged building to permit of the controlling of flow, the collecting of specimens, etc.

The Tanks.—There are, as stated, seven in number, each 40 feet long, 8 feet wide, and 8 feet deep at the upper end, and 9 feet at the lower end, holding about 12,000 gallons. They are built of wood, lined with galvanized iron. The first two are used as grit chambers, in which the sewage remains for one and one half hours. Up to the present all the sewage tested is passed through these two tanks.

The third tank is used as a "plain sedimentation" tank in which the sewage remains eight hours, the object being to remove suspended matter, which it is expected will require to be removed frequently. Septic action will not be encouraged here.

The fourth and fifth tanks were intended to be used for the purpose of experimenting on the efficiency of chemical precipitation, but they were not being so used at the date of visit. One of these, together with the sixth and seventh tanks, are now used as septic tanks, through which the sewage takes eight, sixteen and twenty-four hours to pass.

The Filters.—These are constructed of Cypress wood. They are six feet deep, and are filled with the various filtering materials which it is possible to use in the final plant. They differ slightly in diameter, thirty of them being 7.5 feet, or .001 acre in area, four being 12 feet, 10¾ in., or .003 acres, and one is ten feet in diameter, of these filters two are preliminary contact beds of broken stone, four secondary contact beds of coke, two coke strainers, five sprinkling beds of broken stone, and all a reserve filter.

"The intermittent sand filters are being tested with a view of ascertaining their ability to purify, at different rates of filtration, the effluents from each of the various tanks, as well as the effluent from the contact beds, coke strainers and sprinkling filters. The same liquid is applied simultaneously to two sand filters, but in different quantities, and when a filter having the higher rate refuses to purify its applied liquid, and the filter having the lower rate works satisfactorily, it is taken as an indication that the former is receiving too much sewage in proportion to its area. In varying the rates until the highest practicable one is determined, the proper data for the design of a large plant are obtained. The "dosing" of these intermittent filters occurs only a few hours each day, the intervals being allowed for the penetration of air, whereby the bacteria are nourished.

Contact Beds.—These are made of either broken stone, coke, clay, coal cinders, etc., and the sewage is retained in these beds for a certain length of time before being run off.

Sprinkling Filters.—The filters are built of coarse material, and the sewage is applied continuously in streams, similar to the water from the nozzle of a lawn sprinkler, and is applied constantly, and on this account larger quantities of sewage are treated on a given area. It remains to be seen whether these can operate successfully in winter time.

The staff in charge are kept continuously employed, the station being operated night and day, every day in the week, and the filters are tested every twenty-four hours from hourly samples.

At the time of the proposal to adopt a system of sewage disposal, many of the citizens of Columbus having inspected the Mansfield plant, were anxious to adopt the system without preliminary investigation, as it was so satisfactory, but the advice of experienced engineers in charge of the works, prevailed, and the test station was established. Certainly had not this council prevailed, the City of Columbus would have been led to spend large sums of money for no practical purpose.

Remarks re Experiments.—Regarding the experiments now being carried out, considerable study is being made upon the effect of septic action upon the sewage, as it is claimed that either over or under septisization are deterents to the subsequent treatment of sewage. In other words, if after sedimentation for an hour and a half, the sewage is permitted to remain in the septic tanks, for say, twenty-four hours, the septic action may be prolonged too far, and as a result the liquid may be overripe for treatment either on the contact beds, or sand filters, or again, an eight hour septic action may result similarly. The experiment is, however, being made with Columbus sewage, to ascertain just the correct point to which to push septic action—a fact which clearly indicates the necessity which must ever exist for provision being made by municipalities for the permanent testing of sewage along these lines, for with an increasing population and the opening of new manufacturing industries, the standard of quality of sewage must be an ever-shifting one, necessitating, therefore, the most careful scientific oversight, which to be effectual in producing a non-putrescible effluent, must be constantly and systematically pursued.

Of course, it is impossible to compare results so far obtained; these will not be made known until the compiling of the year's test. Judging by gross appearances of the effluents examined, the treatment by sprinkler and sand filters will take a foremost place. Certainly we shall look forward to the report with much interest, for the earnest and enthusiastic manner in which Mr. Johnston, Mr. Kimberley and Mr. Copeland, are carrying on perhaps the most systematic investigation of the subject which has ever been conducted by any city in the world—certainly on this continent cannot fail to be concluded in a report highly scientific, sound in conclusions and practical of application.

Before concluding, we would desire to express to these gentlemen our sincere thanks for their kindness, courtesy and hospitality, which enabled us to study in detail, the work of this most important testing station.

Summary of the Fourth Report of the Royal Commission on Sewage Disposal.

By DRS. HODGETTS and AMYOT.

NOTE—That portion contained in Sections 5, 6 and 7, dealing with the chemical and bacteriological results, has been summarized by Dr. Amyot; the other portions are by Dr. Hodgetts.

The publication of the Fourth Report of the Commission, which deals with the land treatment of sewage, having just been received enables me to present a summary of the same at this meeting. In view of the fact that the growing cities and towns of the Province have to consider these questions, and the public have not ready access to the more detailed portions of the reports it is trusted they may be of use to those interested in sewage and sewage disposal.

The report itself, as might be expected, is most interesting and comprehensive. Acting on instructions from the Commisisoners the reporters, Drs. G. McGowan and A. C. Houston, and Mr. G. B. Kershaw, visited twenty-nine sewage farms and noted the following points, which are to be found in Sections 1 and 11 of the General Report:—

(I.) The general character of the soil and subsoil, and whether the original surface soil had been "lightened" by ashes or other substances, or "treated" with chalk.

(II.) Whether or not the land was drained, and, if so, the nature of the drainage arrangements.

(III.) Whether the land was cropped, and if so, the nature of the crops.

(IV.) (a) Whether the whole of the crude sewage (liquids and solid together); or

(b) The settled sewage after subsidence in tanks; or

(c) The sewage, after chemical precipitation and settling; or

(d) The effluent from some other artificial process of sewage treatment was being run on to the land.

(V.) Whether surface irrigation or filtration was adopted.

(VI.) Whether the sewage was a domestic sewage or a mixed sewage.

(VII). The provision made for "treating" storm water on the land, and its bulk in relation to the dry weather flow of sewage.

(VIII). The amount of subsoil water gaining access to the sewerage system, and also the proportion of subsoil water which reached the effluent drains on the farm.

(IX.) The number of years during which the farm had been in existence.

(X.) Whether the whole of the soil was really in active operation, or whether any portion of the sewage escaped, in a practically unaltered condition, through cracks or borings into the drains.

(XI.) Whether the different effluents met and mixed together on the farm and discharged into a common channel, or escaped separately into a watercourse.

(XII.) Whether the different effluents were not being discharged into a drinking water or into a non-drinking water stream.

(XIII.) Other points to be considered were:—

Whether the soil was fresh or showed signs of being overdone; whether the farm was well managed and supervised; whether it was worked mainly with a view to producing a good effluent or to obtaining a profit from the crops; and whether the sludge was disposed of on the land of the farm, and if so, how and with what results.

(XIV.) Further, notes were made with regard to the situation of the farm, the total acerage, the total irrigable area, the average area irrigated at one time, the population draining to the farm, the population per acre irrigated, the number of gallons of sewage per head per day, the dry weather flow of sewage per twenty-four hours, the number of gallons of sewage treated per acre per twenty-four hours, separate or combined system, cost of the treatment, etc.

The reports are based, firstly, upon the land treatment of domestic sewage, or of sewage containing no excessive amount of trade effluents. Secondly, farms were differentiated as to the nature of the soil. Thirdly, the different kinds of soil considered in the purification of the effluent were as follows: —

(1)	Sand	Aldershot Camp.
(2)	Gravelly loam	Croydon.
(3)	Light loam	Nottingham and Cambridge.
(4)	Heavy loam	Rugby.
(5)	Clay	South Norwood and Leicester.
(6)	Peaty soil and sand	Altrincham.
(7)	Chalk	Luton.

Samples also being examined from: —
Worsley—Partly peat, partly sand and gravel.
Hemsworth—clayey soil.
Derby County Asylum—Stiff soil overlying red clay.
Lindfield—clayey soil.
Sandhurst—sandy soil.
Woking—Bagshot sand.

A concise table gives the particulars of each of the eight farms kept under observation, which will be found on page 7, of part I. of the Report.

Situation of farm. In the following statement the farms are arranged in the inverse order of their proximity to the town sewered.

Nottingham	about 5 miles.
Beddington	" 3 "
Cambridge	" 3 "
Altrincham	" 2 "
Rugby	" 1 "
Aldershot Camp	less than a mile.
South Norwood	less than a mile.

The distance of a sewage farm from the town served is usually governed by practical considerations, but in general cases there would seem to be a clear advantage in having it at a considerable distance, disintegration, partial decomposition taking place, the longer outfall permitting of uniform decomposition.

It is pointed out that there is a wide distinction between the total average of a farm and the total irrigable area, the latter being that portion laid out for irrigation and actually used at one time or another during the year. The importance is shown of the surplus area for the growing crops capable of being heavily sewaged and readily disposed of when gathered, or for a dairy farm all of which, however, involve additional capital expenditure of a more or less speculative character. The surplus areas ranged from 53 to 13 per cent.

The surplus irrigable area should be regarded primarily as a means of resting land recently sewaged, and secondarily as a suitable soil for the remunerative growth of crops. With good management, however, the larger the surplus irrigable area the better not only is the purification likely to be, but also within limits the prospect of profits.

The proportion of the total irrigable area on the average under sewage at one time must obviously have an important bearing on the results obtained. This point raises the question of intermittency. The more porous the soil the more sewage it is called upon to treat per acre. It is recommended that the question, whether it is better to heavily sewage a limited area with long intervals of rest, or lightly sewage a larger area with shorter periods of rest, should be studied in a systematic manner.

TABLE 2

Sewage Farms Population	Total Acreage.	Total Irrigated area.	Percentage proportion of the total acreage of the farm available for irrigation.
Leicester, 197,000	1,699	1,350	79
Nottingham, 258,584	907	651	71
Beddington, 100,000	673	420	62
South Norwood, 21,000	191	152	79
Aldershot Camp, 20,000	138	120	87
Cambridge, 50,000	102	74	72
Altrincham, 18,000	75	35	46
Rugby, 6,000	40	35	87

Sewage Farms Pop. per acre irrigated	Average area irrigated at one time.	Percent irrigable at one time.	Gallons of sewage per head per day.
Leicester, 146	337	25	36.8
Nottingham, 397	300	46	27.9
Beddington, 238	70	16	40
South Norwood, 138	50	33	28.5
Aldershot Camp, 166	40	33	50
Cambridge, 675	18	24	45
Altrincham, 514	17	48	44.4
Rugby, 171	7	20	50 average 40.

It will be seen that the filtration farms come to the front when the population per acre irrigated as considered than the surface irrigation farms generally.

The causes given for the marked difference in volume, as seen in table 2 are, (1) water supply, (2) subsoil water, (3) manufactured or private sources of water supply.

Rugby and Cambridge are examples of sewage systems where a large amount of subsoil water gains access. Aldershot Camp is an example of a very large water supply per head; Leicester where the water supply is small but refuse factory water considerable, and Nottingham a small water supply. It will be noted that Cambridge dealt with ten times the volume of sewage and nearly ten times the amount of organic matter than did South Norwood, so leaving out the quality of the effluent it is obvious that a filtration farm may be used to treat far more sewage than a surface irrigation farm, bearing in mind, however, that there is a difference in the character of the soil, that of Cambridge being eminently adapted for sewage purification.

As to the proportions between area irrigation at one time and the surplus (resting) irrigable area, it was found impossible to lay down a rule, but tentatively it may be assumed that at least (a) four fifths of a surface irrigation farm and (b) two thids of a filtration respectively should be at rest, it being assumed that (a) one-fifth, and (b) one-third are capable of effectively purifying the sewage until such time as the rest, one-fifth and one-third, respectively, of the surplus irrigable area due in rotation have been sufficiently rested. The report concludes with the statement whether the periods of intermittency should be long or short is a moot point, but there can be no question that the surplus (resting) irrigable area should be considerably in excess of the average area irrigated at one time working area "and continues." Were it reasonably practicable we should press both for a larger area being irrigated at one time than is at present considered necessary, and for more than proportionately larger area (surplus irrigable area) being set aside for "resting" purposes and for the formation and the storing of oxidised nitrogen.

In directing the method of treatment the terms "filtration" and "surface irrigation" are used in place of the older terms "intermittent downward filtration" and "broad irrigation," and the reasons are stated as follows:—

In the first place "intermittency" is essential whether "surface" "irrigation" or "filtration" is employed, so that if the term "intermittent" is to be retained, it should be used alike for the two different methods of treatment, but we think it better to employ it in neither case. Further, the term "downward" would seem to be superfluous in connection with land treatment, and, if stress is laid on this term, an impression is apt to be created that a similar action never takes place where surface irrigation is employed. Moreover, the term "surface" irrigation seems to define what takes place better than the expression "broad" irrigation.

Regarding the character of the soil best suited for the purification of sewage, the chief factors to be considered are:—

1. The number of particles per unit weight of soil.
2. The size of the air spaces between particles.
3. The proportion of humes or modified organic matter which the soil contains.

The following four groups are given:—

1. Sand overlying finer sand.
2. Peaty soil and sand overlying gravel and sand.
3. Light loam overlying gravel and sand.
4. Heavy loam or clayey soil overlying clay.

The following are given as the advantages and disadvantages of the separate systems as compared with the combined.

Advantages. Fluctuations if the sewage flow at the outfall works are reduced during storms.

The road detritus is kept out of the sewers.

A smaller area of the land is required for irrigation purposes at a time when the soil of the sewage farm is already apt to be saturated with rain water.

The routine working of the sewage farm is not embarrassed by frequent fluctuations in the volume of sewage, amounting it may be to two or three times the normal.

If the sewage is pumped, the extra cost of dealing with such increases of flow due to storm water, as are dealt with at the disposal works, is considerably lessened. A saving of the cost would also seem to occur in precipitation schemes.

In districts where the rainfall is heavy, the rain water is carried rapidly away, and the flooding of the low lying levels of the town is less likely to occur. Sewers even of large capacity may be quite incapable of dealing satisfactorily with these sudden fluctuations of flow.

Disadvantages. The occasional natural flushing out of the sewers is lessened. Nevertheless it is chiefly during dry weather that the sewers require flushing.

The dilution of the sewage with rain water is lost to some extent, but against this must be put the increase of total volume of liquid to be dealt with at places where the combined sewerage system is in use, and the fact that "street washings" *per se* may be of objectionable quality.

The initial cost and the maintenance are greater with the separate system, but whether this disadvantage is not more than counterbalanced by among other things, the larger volume of liquid to be "treated" at the disposal works, is a difficult point to determine.

Section III. contains a short summary of the work done by the Rivers Pollution Commission of 1868, together with a reference to the results obtained by the 1857-65 Commission.

Section IV. gives the meterological observations, the methods adopted in the collection of samples and other routine work.

Sections V. VI. and VII. are devoted to the summaries of the chemical and bacteriological results and are reviewed by Dr. Amyot, as follows:

METHOD IN SEWAGE ANALYSIS.

It is advocated that the stating of sewage analyses results for solids be in part per 100,000 by weight for the gases in volumes per 1,000.

SAMPLING.

Specimens should be drawn quietly to prevent aeration, and the bottles completely filled and corked tightly for the same reason. The contents if kept in a cool place are found not to change materially in 25 hours. When hourly samples are taken the sub-samples for analysis should be taken in quantities in proportion with the flow at that hour when possible.

PHYSICAL EXAMINATION.

Color.—Color change between affluent and effluent should be noted as an indication of chemical changes, this was well illustrated with us at Berlin.

Sewage Smell.—Sewage smell unless soon examined for may, in a short time, disappear from oxidation. Sewage smell in an effluent shows unsatisfactory treatment. Generally speaking no smell or an earthy one in an effluent is good.

Matters in Suspension.—The appearance and quantity has manifest bearing on the life of treatment beds.

Reddish brown and well coagulated solids in an effluent mean usually fair purification; grey and not well aggregated usually the reverse.

CHEMICAL EXAMINATIONS.

The standard ammonium chloride solution should be made from a re-crystallized or a re-sublimed salt, and such that it leave no weighable residue when a reasonable quantity of it is vaporised at a moderate temperature in a platinum crucible.

The direct nesslerization in the estimation of Free and Saline Ammonia is not recommended on account of the difficulty met with from turbidity.

In boiling down a sewage or an effluent for nitrate determination it is recommended to add 5 c.c. of calcium bi-carbonate solution (about 0.00304 grns. ca O in I c.c.), if nitrites are present, to prevent any loss of nitrous nitrogen.

The Pyrogallic acid method is recommended as a very excellent one for estimating in a few minutes at least the approximate nitrate content of an effluent. The results compare very favorably with the much longer drawn out "Couple" method. The method can be used in the field and again the apparatus required is very simple.

It was found that the addition of sugar to the zinc and acid for reduction was not of benefit in accuracy of the results in the Kyeldahl estimation of the total nitrogen in he various kinds of effluents.

For general work upon sewages and sewage effluents the method "without reduction is advised against.

The volumetric estimation of solids by the centrifuge is highly spoken of.

BACTERIOLOGICAL EXAMINATION OF SEWAGE.

The time is past usefully to discuss whether it is better to have a sterile effluent rich in organic matter, or a non-sterile effluent free or nearly free from putrescible matter. All effluents, whether sterile or non-sterile, must be relatively free from all substances susceptible to the action of putrifactive bacteria. Further, at all events in the case of drinking water streams, it is necessary for the chemist to say whether the effluent is free from chemical poisons in dangerous amount.

"Microbes of Indication."

In the above term Dr. Houston includes the Colon Bacillus, Bacillus Enteridis Sporongenes and Streptococci especially and these are practically always present in sewage. He believes that their presence (and their proportionate number) in a liquid is an indication of the possibility (and broadly of the degree of probability) of the presence as well of other micro-organisms causally associated with the occurence of epidemic disease. Crude sewage it may be assumed is always a potentially dangerous liquid. He thinks that the relative abundance of these "microbes of indication" in effluent indicates the degree of biological purifications affected by the particular process of sewage treatment under investigation: in other words, that the status of an effluent in respect of possible danger to health as judged by the greater or less abundance in it of these "Microbes of Indication."

"After careful consideration," says Dr. Houston, "I should be inclined to say that in the case of non-drinking-water streams, *except where oysters and other shell-fish which are eaten raw are concerned*, the bacteriological character of an effluent is of secondary importance."

He concludes that for an effluent to be discharged into a drinking water stream.

1. That though a chemical standard is necessary, a bacteriological is of more importance.

2. That the biological tests recommended in this connection are those which deal with the estimation of the relative abundance of microbes of intestinal origin ("Microbes of Indication") in sewage and sewage effluents.

3. That the status of an effluent from the point of view of potential danger to health, may be judged by the numerical estimation of these "microbes of indication" (e. g. B. Coli, B enteridis sporogenes, streptococci, etc.).

4. That although the complete sterilization of sewage effluents is recommended a a counsel of perfection, the standard suggested as a practical one is partial sterilization. (Absence of B. Coli from I c. c. of the effluent.)

5. That in the case of *non-drinking water streams* a bacteriological standard is of secondary importance, but it may prove valuable as *an adjunct to the chemical standard.*

Sample results obtained at Aldershot Camp Sewage Farm and at the South Norwood Farm, bacterially and chemically.

Aldershot Camp Sewage Farm.

138.5 acres average area irrigated at one time 40 acres, population 20,000, quantity per 24 hours 1,000,000 gals., average per acre 25,000 gals., per day. Quality, "Domestic." "Screening," "Settling tanks," and "Land filtration," Land, "Sand," 36 years old.

Results Obtained.

Bacteriological.

	Total Bacteria Per c. c.	Colon B. Per c. c.	B. Enteritidis Sporogenes.
Sewage...............	33,618,000	At least 100,000	At least 1,000 but less than 10,000
Effluents............	183,266 99% Removal.	At least 100	At least 10 but less than 100

Chemical.

	Free Ammon	Alb. Ammon	Oxygen Consumed	Chlorine
Crude Sewage....	7.87	1.62	20.79	14.98
Effluents.........	1.85	.26	2.72	

South Norwood.

Acres 191. Average irrigated at one time 50 acres; population, 21,000. Sewage 600,000 gallons per acre per day, 12,000 treated. "Domestic," "Screening," "settling tanks," "surface irrigation," soil, clay or clayey. 36 years old.

Bacteriological.

	Total Bacteria Per c. c.	Colon B. Per c.c.	B. Enteritidis Spongenes.
Sewage..............	48,600,000	At least 100,000	At least 1,000 but less than 10,000
Effluents............	778,322 98%	⅔ of effluents showed more than 1,000	⅔ of effluents showed more than 10

Chemical.

	Free Ammon	Alb. Ammon	Oxygen Consumed	Chlorine.
Crude Sewage........	3.54	.67	7.71	7.45
Effluents..............	.87	.10	1.44	

These results are not up to the standard required for discharge into a drinking-water source.

And yet land treatment shows better results than any of the artificial methods.

Effluents were found not to vary very materially in different seasons, in favor of cold seasons.

STANDARDS SUGGESTED BY CERTAIN AUTHORITIES ON SEWAGE DISPOSAL.

Rivers Pollution. (a) Liquid shall not contain, as solids in suspension, more than three parts by weight of dry mineral matter, or more than 1 part by weight of dry organic matter in 100,000 parts of effluents.

(b) It shall not contain in solution more than 2 parts by weight of organic carbon, or more than .3 parts by weight of organic nitrogen per 100,000.

Mersey and Irwell Rivers Board. .12 alb. ammonia per 100,000 and 1.43 parts oxygen absorbed in 4 hrs. at 60 degrees F. At the same time account of the rate at which an effluent takes up dissolved oxygen and nitrate from water should be noted.

Dr. Barwise of Derbyshire County Council.

Total suspended matter less than	3.00	per 100.000.
Oxygen absorbed	1.50	
Alb. Ammonia	.15	
Nitrogen as nitrates at least	.25	

Ribble Joint Committee's provisional standard.

Alb. Ammon. if under 0.1 parts per 100,000 effluent good.
Alb. Ammon. if under .15.2 parts per 100,000 unsatisfactory.
Alb. Ammon. over .2 parts per 100,000 bad.

Section VIII. is more fully covered in a review of Part IV. of the Report.

Section IX. deals with the "General Conclusions" arrived at by the Commission, and although possibly they may appear lengthy yet are given as concisely as possible, so that the reader may yet obtain an intelligent understanding of this very important work.

GENERAL CONCLUSIONS.

Can land effluents be discharged into drinking water streams?

1. The effluents from land processes of sewage treatment, are not from the bacteriological point of view, in a proper condition for discharge into drinking water streams.

Is the bacterial flora of land effluents characteristic of sewage or of soil?

2. The effluents from land possess a bacterial flora characteristic of sewage, and the microbes characteristic of soil (in the sense of being peculiarly abundant in soil) are relatively absent from land effluents (see Part III., Bacteriological Report.

Is the bacterial flora of sewage intrinsically modified by land treatment?

3. As a result of its treatment on land, and judged by the bacteriological tests employed in this investigation, sewage does not seemingly become modified in its biological characters to any material extent (see Part III. Conclusions). The bacteria, however, were reduced in number to a marked extent (see Part III. Bacteriological Report).

Results of examination of samples of subsoil water. Objections for domestic use to wells sunk in polluted soil.

4. The few samples of subsoil water collected in the neighborhood of some of the sewage farms were usually found to be pure, both chemically and bacteriologically, but, this of course, must not be regarded as proving that wells sunk in such situations are safe for domestic use, or free from serious objection.

Chemical and biological qualities of the river water above the effluent outfalls.

5. The samples of water collected above the effluent-outfalls, from the rivers into which the effluents from the several sewage farms are discharged varied considerably. They would all have been condemned bacteriologically from the point of view of drinking water. Even from the point of view of non-drinking water streams their condition was not always satisfactory, either chemically or bacteriologically. Below the effluent outfalls the mixed liquid (river water and effluent) was, under the circumstances, usually not unsatisfactory (see Parts II. and III. Chemical and Bacteriological Reports). Generally speaking, the discharge of the effluents into the respective streams did not exercise any marked prejudicial effect on the water of the stream; indeed, the reverse was sometimes observed. There seems to be no reason to doubt that the effluents from properly-managed sewage farms would, when discharged into non-polluted streams of relatively large volume, neither give

rise to any nuisance, nor, so far as may be judged by rate of absorption of oxygen, prove injurious to fish.

Chemical and biological quantities of storm water and "street washings."

6. The samples of storm water examined were almost invariably found to be most impure, both chemically and biologically. The samples of the "street washings" (separate system) were all impure biologically, notwithstanding that some of them were fairly pure organically from the chemical point of view and withstood the incubation test under laboratory conditions of experiment. The results, however, show that even when a street water is comparatively pure organically, it requires adequate settlement for grit, and, further, that the liquid may be very impure even after long-continued rain. The practical advantages of the separate system may be great, and doubtless storm overflows are necessary; but the fact that storm liquids may be so impure, both chemically and bacteriologically, is a point of considerable importance. (See Parts II. and III. Chemical and Bacteriological Reports).

Basis for calculating.

7. In defining the work done by land in the usual way of speaking of "population per acre" is open to the objection that the volume of sewage per head per day may, and does, vary to a considerable extent at different places, and that a large volume of sewage per head of the population does not always mean a correspondingly weak sewage (see Rugby and Aldershot Camp). The best way, in our opinion of recording the work done by land is to speak of the number of gallons of sewage exclusive of storm water) treated per acre per 24 hours (a) on the "working" area, and (b) on the total irrigable area (working and "resting" areas), together with notes as regards the organic strength and other characters of the sewage, the amount of storm water dealt with on the farm, and the depth and quality of the soil and subsoil. (Section II. of the Report).

Comparison of terms.

8. The old terms "intermittent downward filtration" and "broad irrigation" for the reasons previously stated, have been replaced by the terms "land filtration" and "surface irrigation" (see Section II. of this Report).

Can land purify sewage indefinitely? Disposal of sludge.

9. Special attention must be directed to the length of time some of the farms have been in operation (five of them for over forty years), and to the fact that some of them have disposed satisfactorily of their sludge on the farm during the whole period of their existence as sewage farms. Further, that most of them, year by year, have been called upon to treat an increasing volume of sewage without corresponding enlargement of their irrigable area. There seems no reason to doubt that, with proper management, land can purify sewage for a practically indefinite period. (See Section II. of this Report).

Screening and settling.

10. We are of the opinion that sewage before it is applied to land should be efficiently screened and settled, unless it is already in a thoroughly disintegrated condition. Where the sewage is fresh, especially in the case of

heavy clay soils, used as surface irrigation farms, this is very necessary. Porous, sandy soils, however, worked as filtration farms, can in some instances without apparent detriment receive sewage in the raw condition and some observers consider that their efficiency is, if anything, increased thereby. But there is always the possibility of nuisance arising in this way.

Chemically precipitated and artifically treated sewage.

11. As regards chemically-precipitated sewage and sewage treated by artificial processes antecedent to delivery on land, our data are insufficient to pronounce a decided opinion: but the views generally expressed by the witnesses called before the Commission are, no doubt, correct, namely, that the land can deal directly with raw sewage but it is better first to separate the solids mechanically; and if the sewage of a large town has to be applied to a limited area of land it may be advisable first to treat it chemically or to pass it through bacteria beds. (See Section II. of this Report).

Trade Refuse.

12. As regards trade refuse, the only two farms kept under observation where trade refuse was present in any quantity in the sewage, were Leicester (three-fourths domestic, one-fourth trade refuse), and Nottingham (four-sevenths domestic, three-sevenths trade refuse). The effluents from Nottingham were remarkably good; and those from Leicester fairly satisfactory, considering the available irrigable area, the nature of the soil, the method of treatment, and the volume of sewage being dealt with. Nevertheless, we do not assume from this that trade refuse (especially some kinds), if present beyond a certain proportion, may not seriously inhibit, if not prevent, the purification of sewage by treatment on land. On this point several of the witnesses before the Commission spoke somewhat strongly from personal knowledge and observation (Section II of Report).

Are sewage farms a source (direct or indirect) of danger to health?

13. As regards the likelihood of sewage farms being dangerous to health we can do no more than tentatively express the opinion that no convincing proof has yet been furnished of direct or wide-spread injury to health in the case of well managed farms. It may be possibly that the foul emanations from a badly managed or over-sewaged farm constitute an indirect source of danger to health by lowering the vitality of weakly and susceptible individuals.

Questions relating to stock and farm produce.

14. Further, even sentimental considerations are not to be ignored in this matter, and the alleged depreciation in the value of house property due to the proximity of sewage farms is, if true, a serious question. We are, therefore, of the opinion that subject to practical considerations, sewage farms in the neighbourhood of populous districts are liable to objection. In this connection the probably beneficial effect of a surrounding belt of shrubbery and trees has not, perhaps, been sufficiently recognized. As regards the produce from sewaged lands we are, on the whole, not in favor of sewage farms being utilized for the raising of crops for human consumption, however remote may appear the danger to health. But in respect of stock the case is different; and although we think it a wise precaution to keep cattle off recently sewaged

land, we see no reasonable objection to stock being fed on the produce of antecedently sewaged land. But whenever there is a likelihood of the spores of B. Anthracis being present in the sewage, special precaution should certainly be taken as regards the grazing of animals on land "treated" therewith.

Questions of profit or loss; cropping etc.

15. Although we are of opinion that sewage farms in general can never be expected to show a profit if interest on capital expenditure is included, the fact that in favorable seasons some of them can more than cover the working expenses is a point in favor of cropping in connection with the land treatment of sewage. Moreover, in our opinion, cropping makes for purification, given good management, a volume of sewage not out of proportion to the average area under sewage at one time, and a suitably large "resting" area. We are not in favor of sewage farms being let; unless the irrigable area is very large a tenant must sometimes be placed in the awkard position of having to choose between damaging a crop on the one hand, and purifying sewage imperfectly on the other.

Management of sewage farms.

16. Is is impossible to lay too much stress on the importance of farms being well managed; but in this connection we desire to state that farm managers have usually a most difficult part to play, and no amount of care and attention will ever enable land, of any kind, to deal with a volume of sewage out of all proportion to the effective purifying area of the soil. We recommend that farm managers should be taught some simple test or tests to enable them to follow for themselves the operations of the land; that their instructions should be in writing, and should include a definite order to consider the farming results as quite secondary to "turning out" uniformly a satisfactory effluent; that the statistics of the farm should be most carefully kept; and that, wherever possible, the flow of sewage and of storm water should be gauged throughout the year. In the case of all sewage works, permanent provision should most certainly be made for recording, by some reliable method of gauging the daily flow of sewage. Meterological observations are also of importance. For example, a comparison between the curves of the air and of effluent temperatures may afford a useful indication of the amount of filtration that is taking place on the farm. (Part IV. Engineering and Practical Report).

Questions of temperature in relation to the land treatment of sewage.

17. During the period of our investigation no opportunity occurred of watching the working of sewage farms during a prolonged period of exceptionally frosty weather. Nevertheless, on a number of occasions the weather was very cold, and the temperature of the air frequently sank below freezing point. During these periods the ordinary working of the farm was not, so far as could be seen, seriously interfered with, and no lasting or marked deterioration of the effluents was observed. Although we are of the opinion that temperature is a most important factor in purification, the range of temperature at which the bacteria concerned in sewage purification work is so wide that it can but seldom happen in this country that their vital activity is more than temporarily restrained. Surface irrigation farms suffer most in this respect, although, if the frost is sufficiently prolonged filtration arms may also become affected. As explained elsewhere, the temperature of the effluents from surface irrigation farms varies almost in direct correspondence with

the air temperature, whereas the temperature of the effluents from filtration farms is mainly governed by the temperature of the soil. The witnesses examined before the Commissioners expressed on this subject the most contrary views but we agree with those who stated that frost and snow do not usually prevent, although they may retard, purification of sewage by treatment on land. Nevertheless, we think that frost, if exceptionally severe and prolonged, may prove a serious hindrance to effective purification, more especially on surface irrigation farms.

Nature of crops best adapted for sewage farms.

18. We have already expressed the opinion that cropping may be advantageous. As regards the nature of the crops, cereals are, practically speaking, inadmissible on that portion of the irrigable area which at some time or other during the years working of the farm is meant to be sewaged. The best crops are those which can be more or less continuously sewaged without detriment, e.g., quickly growing plants like rye-grass, mangel-wurzel, prickly comfrey, etc.

Storm water and fixed overflows.

19. The question of storm water and fixed overflows is a most difficult one. Some of the witnesses examined before the Commission expressed the view that where storm water is to be dealt with on the land, the area of the land required must be calculated upon the maximum volume of sewage that may be brought to the farm. Without in any way dissenting from this proposition in the abstract, it may be pointed out that if provision were made for treating at any one time sewage and storm water equal in amount to six times the dry weather flow of sewage, and if the basis for calculating the area required for purifying storm water were the same as for ordinary sewage the surplus irrigible area on all farms would have to be increased to a serious extent.

Suggestions for lessening difficulty of treatment.

20. Existing sewers are seldom large enough to cary off satisfactorily up to six times the dry weather flow of sewage, still less all the storm water in extreme cases, and if in the case of new sewerage schemes this were remedied the cost would be serious, and the sewers would be large in relation to the dry weather flow of sewage, and disproportionately large in relation to the periods of minimum flow of sewage. Assuming, however, the possibility and practicability in all cases of a volume equal to six times the dry weather flow being brought to the farm we consider that the difficulty of treatment would be lessened by; (1) increasing the capacity of the settling tanks; (2) having a larger "resting" area (not, however, at the expense of the "working" area, but by enlarging the total irrigable area); and (3) in particular cases by laying out portions of the land in special ways, e.g., lagoons, storm water filters, etc., which need not be described here, since these matters would be determined by the local conditions.

The difficulty of treating storm water is largely an emergency one. As regards one and two above, by increasing the capacity of the settling tanks the effect of sudden fluctuations on the volume due to storm water would be in some measure controlled; the provision of a large "resting" area would tend to prevent the normal "working" area from being overpressed during storms, as the former could be temporarily utilized to treat the increased volume of liquid. As regards (3) the subject is so wide, and depends so much on local circumstances, that it would be unwise to consider the matter further here.

So far as our observations go, the effluents from sewage farms treating a large proportion of storm water do not deteriorate to any marked extent; they may even show a temporary improvement during periods of wet weather. But during wet weather the normal working of the farm may be seriously embarrassed, and it is difficult to estimate the ultimate effect of storm water on the qualities of the effluents. Moreover, it must be remembered that a storm water effluent from the land may be as pure or purer than an ordinary effluent, but that if the total bulk of the storm water effluent is several times in excess of the normal volume, the effect on the river water may be the reverse of satisfactory.

In this connection we desire again to emphasize the fact that neither chemically nor bacteriologically is mere dilution synonymous with purification. Granting the impracticability of treating more than a certain proportion of storm water, it should be definitely understood that storm water is diluted, not purified sewage.

Rate of intermittency.

21. We have already expressed our opinion that the data available are insufficient to enable us to give any definite statement as to the best rate of intermittency either as regards filtration or surface irrigation farms. By "rate of intermittency" is meant, of course, whether the alternate periods of working and resting the land should occur at short or long intervals. It is obvious that if the alternations be too frequent the "resting" area may not have time to recover its full purifying capacity before it is again sewaged, and, on the other hand, if the alternations be too infrequent the "working" area may be rendered "sewage-sick; meanwhile the "resting" area would be lying idle long after it had recovered its purifying ability.. A competent manager finds out by experience the best way of working the farm under his care; but it is desirable that the matter should be investigated experimentally, so as to enable certain general rules to be laid down for the preliminary guidance of persons responsible for the management of sewage farms.

Ratios of (1) *total irrigible areas and total acreage* and (2) "*resting*" *and* "*working*" *areas of the total irrigable area.*

22. As regards the ratios between (1) total irrigible area and the total acerage, and (2) the "resting" and "working" areas of the total irrigable area, we have previously pointed out at some length that the first consideration is to have (a) the "working" area (i.e., the area under sewage at one time) large enough to purify efficiently the whole volume of sewage which is being treated. Secondly, that (b) the "resting" area should be greater in the case of surface irrigation farms than for filtration farms. The ratio of (a) to (b) at Beddington was 1 in 6, and at Nottingham 1 in 2. Without venturing to lay down any fixed rule, we think that a ratio of about 1 in 5 and about 1 in 3 as regards surface irrigation and filtration farms, respectively, is desirable; but the above statement is based on too limited a number of observations to be of much value. A large "resting area is especially necessary when much storm water is treated on the farm. Thirdly, that the surplus acerage (that is the area representing the difference between the total irrigable area and the total acreage) should be ample. At Altrincham the surplus acreage was 53 and at Rugby 12 per cent. At the present time Altrincham is taking advantage of its relatively large surplus acerage, and is laying out a portion of it as an addition to the irrigable area.

Separate or combined sewerage systems.

23. As regards the respective advantages and disadvantages of separate and combined sewerage systems, reference must be made to Section II. (particulars relating to each of the eight sewage farms kept under detailed observation). We may, however, again point out that the liquid carried away by the separate sstem is not, so far as our few analyses go, in a fit state to be discharged without treatment into any river.

Suitability of different kinds of soil.

24. The witnesses examined by the Commission as to suitability of different soils expressed very divergent views, some of them considering certain kinds of soil quite unsuitable, while others were of the opinion that any kind of soil is capable of purifying sewage. Nearly all of them were agreed that light sandy loam overlying gravel and sand was the best type of soil for the purpose, while chalk, clay, peat, and water-logged soils were regarded as either less suitable or as altogether unsuitable for sewage purification. Upon this point we may at the risk of repetition shortly summarise our own experience.

A. Filtration.

1. Excellent results can be obtained from light loamy soil overlying a porous subsoil.
2. A sandy soil and subsoil are also capable of yielding good results.
3. The same may be said of partially peaty soil overlying gravelly sand.
4. Peat pure and simple is not well adapted for sewage purification.
5. With regard to chalk, we can hardly speak with confidence, more data being required. The few (artificially obtained) effluents which we examined from a chalk farm had percolated in about a minute and a half through approximately three feet of chalk (from which the surface soil had been removed) in so doing they had undergone comparatively little purification organically, although the liquid in its passage dissolved out a large quantity of nitrate—the product no doubt, of the oxidation of sewage matter run on at a previous time. The purification would, of course, have been better had the surface soil also taken its part. But the above very rapid rate of filtration of sewage through the fissured chalk emphasizes the necessity for carefully considering any possible connection that may exist between a sewage farm on a chalk and water supply.

B.—Surface Irrigation and Combined Surface Irrigation and Filtration Farms.

Heavy loam and clay soils, although not so well suited for sewage purification purposes, may in our experience yield fairly good effluents if the volume of sewage treated per acre is relatively small.

Thus, almost any kind of soil can be used for the purposes of sewage purification, provided, of course, that the volume is proportionate to the purifying capacity of the soil in question. In certain cases, no doubt, this volume would be so small as to render the particular method of treatment impracticable, but where the line should be drawn it is difficult to say. The price of land and other local conditions must needs influence this question of practicability. We are far from advocating the treatment of sewage upon land which is, practically speaking, not well suited for the purpose, but this does not invalidate the truth of the proposition, that the matter is nearly always one of degree of suitability, and seldom one of intrinsic disability. In reference to this we would lay stress on the good quality of the best effluents obtained from all the eight sewages farms kept under detailed observation.

Volume of Sewage per Acre. Population per Acre.

25. A divergence also showed itself in the opinions of witnesses with respect to the question of population and volume of sewage allowable per acre. Some of them considered that the maximum limits should be 5,000 gallons per acre per 24 hours for an irrigation farm and 30,000 gallons for a filtration farm. Allowing 40 gallons of sewage per head per day, this works out to 125 and 750 persons per acre respectively. On the basis of population other witnesses gave 100 to 1,000 persons per acre as the working limits, the number varying with the process of treatment adopted, the nature of the soil and other factors. Converted into volumes of sewage per head per 24 hours (at 40 gallons per head), this gives 4,000 to 40,000 gallons per acre.

This figure of 40 gallons is taken because it was the average volume at the eight principal sewage farms kept under observation. According to some statistics collected recently by our colleague, Mr. Colin C. Frye, it is probably not far from the mean for the towns and cities with a population of 10,000 to 100,000 and over, though much too high for small towns and villages. It is brought forward here for comparative calculations only. It is difficult to see how this small volume could be satisfactorily spread over an acre of ground.

The comparisons made merely brings into further relief the need for fortifying with additional data the terms "filtration", "broad irrigation", "method of treatment", etc., which, taken alone, are insufficient. Thus, (1) when "filtration" is spoken of it should be supplemented by notes of the depth of soil and subsoil, of their mechanical composition, their water-holding capacity, and if possible, of the average rate of filtration of water through them. (2) "Broad irrigation" is clearly very different in degree when carried out over a shallow clayey soil resting on a stiff clay and on a fairly deep porous soil. The nature, depth and mechanical composition of the respective soils are again wanted here. (3) The character and strength of the sewage to be treated should be ascertained, and the relative amount of organic matter which it is proposed to treat per acre might advantageously be plotted out. If a sufficient number of instances were available for reference, the purifying capacity of a given soil for a sewage of given strength ought to be deducible with a fair approximation to accuracy.

While our own investigations have not been sufficiently comprehensive to allow of any very definite conclusions being drawn with regard to these points (or with regard to the best ratio, between the "working" and "resting" areas and the rate of intermittency), we can show the results obtained with certain soils, of which the mechanical composition has been experimentally determined, when treating sewages of known volume and strength under definite conditions of working.

SUMMARY.

26. In the first place the best kind of soil for filtration purposes (e.g., light sandy loam overlying gravel and sand) can certainly purify to a remarkable extent, at the rate of 23,000 gallons of a strong mixed sewage per acre per 24 hours (a) at a given time; and over 10,000 gallons per acre per

24 hours (b) on the year's working of the total irrigable area (see Nottingham) Further, under (a) and (b) sets of conditions, over 100,000 and over 30,000 gallons respectively of a rather weak sewage can be purified to a fair although not to an altogether satisfactory extent.

Secondly, with soil less well suited for filtration purposes (e.g., sand and partially peaty soil lying upon sand and gravel) from about 25,000 to 46,000 gallons of sewage per acre per 24 hours (a) at a given time, and from about 8,000 to 23,000 gallons per acre per 24 hours (b) on the year's working of the total irrigable area, can be treated so as to yield effluents fairly good, but, on the whole, not quite satisfactory (see Aldershot Camp).

Thirdly, with soils passing from gravelly loam to heavy loam or clay, all being worked as combined surface irrigation and filtration farms, from about 12,000 to 57,000 gallons of sewage per acre per 24 hours (a) at a given time, and from about 4,000 to 9,000 gallons per acre per 24 hours (b) on the year's working of the total irrigable area can be treated so as to yield effluents moderately good, but still not altogether satisfactory (see Beddington, etc.).

To summarize all our results within the limits of a few sentences is impossible, but we may say in conclusion, and speaking in general terms, that we doubt whether even the most suitable kind of soil worked as a filtration farm should be called upon to treat more than 30,000 to 60,000 gallons per acre per 24 hours at a given time (750 to 1,500 persons per acre), or more than 10,000 to 20,000 gallons per acre per 24 hours, calculated on the total irrigable area (250 to 500 persons per acre). Further that soil not well suited for purification purposes worked as a surface irrigation or as a combined surface irrigation and filtration farm, should not be called upon to treat more than 5,000 to 10,000 gallons per acre per 24 hours at a given time (125 to 250 persons per acre), or more than 1,000 to 2,000 gallons per acre per 24 hours, calculated on the total irrigable area (25 to 50 persons per acre). It is doubtful if the very worst kinds of soil are capable of dealing quite satisfactorily even with this relatively small volume of sewage. The population per ace is calculated on 40 gallons of sewage per head per day. It is here assumed that the sewage is of medium strength and is mechanically settled before going on to the land.

Comparing the above figures with the volume of sewage capable of being treated by artificial processes, we note that the witnesses examined by the Commission generally expressed the following opinion:—

Contact Beds.—750,000 gallons per acre per 24 hours, allowing for periods of rest, but not for secondary treatment. Allowing one acre of secondary bed for every two acres of primary bed, about 500,000 gallons per acre per 24 hours could according to this view be finally treated. It is assumed always that the sewage has been previously treated either by chemical precipitation, or by subsidence in settling tanks or in a septic tank.

Continuous Filters.—About 484,000 to 2,904,000, 4,840,000 according to one witness, gallons per acre per 24 hours. Previous treatment by chemical precipitation, or subsidence in settling tanks, or in a septic tank is assumed.

Apart from the question of the quality of the effluents it is obvious that, generally speaking, a larger volume of sewage can be treated by artificial bacteria bed process than by land.

Part IV. contains the Engineering and Practical Report by Mr. G. B. Kershaw. The first part being description with plans and drawings of the different farms, showing the under drainage, settling tanks, screening arrangements, etc., together with notes on temperature and rainfall, and tables showing all the samples drawn from the different farms, all of which are of great value to the student of this important question, but unfortunately are of too great a bulk to reproduce in this review.

In Appendix A. of this part are found the daily records of the atmosphere, sewage and effluent temperatures for a period of one year at four of the eight farms, at two of which, Nottingham and Aldershot Camp., the filtration method is carried on, and at South Norwood and Beddington surface irrigation is in vogue. The objects of these observations were to ascertain:—

(1) How different temperatures affect the purification.

(2) The difference between the temperatures of the effluents, sewage and air at one time.

(3) The difference between the effluent temperature from surface irrigation as compared with filtration sewage farms.

(4) The relation between—
  (a) The air temperatures.
  (b) The effluent temperatures at
    (a) Surface irrigation farms.
    (b) Filtration farms.

The diagram shows that, broadly speaking, the effluent temperatures in surface irrigation follow the variation of the air temperature, while the filtration effluents are not similarly effected. In March and October the effluent and the air temperatures on all four farms approximate each other closely. In the case of filtration farms the effluents from October to March are warmer than the air, whilst with the surface irrigation farms the reverse obtain throughout the year.

It was found that owing to evaporation, transpiration in summer is very great on all the farms and a stronger sewage is being treated than that which arrives at the farm; on the other hand, snow and rain tend to dilute the sewage.

Regarding frost which, of course, is light in England compared to this country, it was found that prolonged frosts penetrate much further into clay soils than in the case of light porous soils.

The observer states that the degree of smell from sewaging operations was more perceptible in the presence of a high degree of humidity than when the atmosphere was comparatively dry. The diffusion of smells from the sewage farms seems to be largely influenced by other factors, such as barometric pressure and absence of wind. In Appendix C, Mr. Kershaw discusses sewerage systems under two heads:—

(1) The combined system in which all roof and surface water is admitted.

(2) The partially separate system in which water from the streets, pavements and front roofs of houses is carried direct to the watercourses, etc., by separate sets of sewers and not treated. As the separate system proper is rarely carried out it is not discussed.

In England at the present day the tendency of corporations is to provide the "partial separate system". The advantages of this system are:—

(1) Fluctuations in sewage flow lessened.
(2) Amount of sludge lessened; no road detritus.

Objections—

(1) Street and back yard scourings often as foul as the sewage is carried to creeks, etc.

(2) A tendency to empty slops, etc., into streets finding way into separate system.

(3) Where both systems exist at back of houses a danger of sewage drain being connected with rain water sewer.

The points in favor of the combined are—

(1) The rainfall admitted materially assists in scouring out the sewers. It is, however, in dry weather flushing is mostly required.

Objections—

(1) Practically impossible in most towns having a high rainfall to construct sewers at any reasonable cost, capable of carrying off all the rainfall apart from the question of treatment. The flow in sewers during dry weather is so low in velocity an enormous quantity of water is required to flush them satisfactorily.
(2) In case of chemical precipitation there is increased cost.
(3) The volume to be pumped is increased.

The question of the relative cost of the two systems depends largely upon local conditions, e.g., whether facilities exist for discharging the storm water without long, and, therefore, large sewers. The separate system permits of smaller sewers being constructed at a less depth. The question is one, however, mainly to be decided according to the requirements of the case, and determined largely by the nature of the street washings, and whether the liquid is going to be discharged into a drinking or non-drinking water stream. The question then resolves itself into this, is it better to receive the rainfall from the foul water sewers and have a system of storm overflows, or to divert the rainfall into separate sewers? In other words, which is less harmful, dilute sewage or liquid drained from streets, etc.? The report points out that the question must be decided by chemical and bacteriological examinations with due regard to the fact that

(1) In the majority of cases storm overflows will be a necessity of both systems if flooding of streets is to be avoided.
(2) Both storm overflows and separate systems frequently discharge into the same stream or river which receives the effluent, and
(3) If large volumes of sewage and storm water are dealt with on land already saturated with rainfall the result will be that the volume of the effluent from the farm will be greatly increased.

Regarding storm overflows the reporter is of opinion that it is probably impracticable to construct sewers to carry off all the rainfall without providing safety valves, in the shape of storm overflows. A further disturbing factor is the infiltration of subsoil water, this is, however, influenced by the nature of the strata in which the sewers are laid; the maximum amount is likely to occur in water bearing gravel, and the minimum in a stiff sub-soil. This leakage in new sewerage schemes is estimated at one cubic foot of sub-soil water per mile per minute for all sewers.

It is pointed that the point at which a storm overflow should come into operation is determined by local circumstances which are—

(a) The nature of sewage.
(b) Volume of sub-soil water gaining access to sewers.
(c) Volume of river or stream into which storm overflows discharge.

It is assumed that thirty gallons per head is a fair average, and the case of two manufacturing towns of the same population is taken to illustrate the question.

A—producing thirty gallons of sewage per head per day.
B—producing sixty gallons owing to sub-soil water.

On the assumption that both towns have storm overflows working at six times the dry weather flow, the overflow from A will discharge at 180 gallons per head, whereas B will have to treat 360 before an overflow is permitted, although presumably the quantity of polluting matter produced by individuals in town is to all intents and purposes the same. It follows that in such case B will be put to considerably more expense both in laying down a sewerage system, and also in provision of land to deal with such a large volume of sewage which is weaker in nitrogenous matter than the liquid overflowing untreated in A. To obviate in some degree this expense storm overflows are provided for drainage areas, in addition to the main storm overflow at the outfall sewer. With regard to the amount of storm water likely to reach the sewage farm during rainfall there is no invariable relation between rainfall and increase of flow at the sewer outfall, this depending upon a variety of circumstances such as slope of ground, size, length and gradients of the branch and outfall sewers, for instance, it does not follow that because a rainfall of 0.5 inches from noon to 3 p.m. on one particular day gives, say, six times the ordinary rate of flow for that period, that the same amount can be relied upon on another occasion, with a similar rainfall of like intensity. A saturated surface and a high degree of humidity give a maximum "off flow" and conversely, a dry surface with a high temperature and drying wind will give the reverse with an indefinite number of graduations between the extremes; and it is to be found that frequently an immense "off flow" is caused after a severe frost and snow, by a sudden thaw accompanied by rain, the frozen state of the ground rendering it practically impervious.

Settling Tanks.—This is spoken of as a most important question, their prime object being to remove the bulk of suspended solids in the sewage before going on to the land, by subsidence either mechanical or chemical. The forms of tanks are said to be numberless, but they are all worked either as the continuous or quiescent system. In some schemes night and Sunday pumping is obviated by an enlargement of the outfall sewer.

In the continuous system the sewage is constantly running through the tanks, while in the quiescent method, a tank is filled with sewage, allowed to rest for a certain period, and the clean portion drawn off by means of floating arms.

It is said the efficiency of these tanks varies to a certain point, almost proportionately to the rate of flow through them. Mr. Kershaw claims that on the design of the tanks, apart from the question of effective sedimentation, depends in a great measure the question whether the removal of sludge is going to be a tedious and expensive operation or the reverse, and recommends that the design be such as to facilitate cleaning with a minimum labor, for this purpose sufficient slope should be given to tank floors, whereby the sludge will slide to the sludge slump.

Of rectangular tanks the best form is that in which the tank bottom slopes downward from the outlet sill to the inlet of the sewage, the bulk of the sludge having a tendency to remain at the deeper (or inlet) end of the tank where it can be withdrawn by opening a valve without greatly disturbing the surface liquid. It is further stated that the greater the length of the overflow sill the more even will be the flow into the sill, and consequently the more even the sedimentation.

The sludge is run off either—

(1) Into a sludge bed;
(2) Into the carriers and thence to any part of the land;
(3) Into a sludge well from which it is raised by a chain pump.

The more effectually a sewage is settled the larger the amount of sludge produced.

In Great Britain the general rule for the capacity of settling tanks is based on the fact that eight per cent. of the total dry weather flow may be received at the farm in an hour. Two hours being allowed for efficient sedimentation, therefore, a tank to allow of a settlement of two hours must have a capacity equal to sixteen per cent. of dry weather flow, but this tank cannot be used during cleansing operations, so a second similar tank will be required, bringing the capacity up to thirty-two per cent. A third tank for use during storms brings the total tank capacity up to forty-eight per cent., or nearly half of the dry weather flow. The tanks are usually subdivided, as by this method a larger portion of the tanks continues working when cleaning out takes place.

The capacity of upward straining tanks will not need to be so high, as in this case the sewage rises through a layer of filtering material resting on a false bottom, and thence over the tank sill.

Underdrains and Carriers.—In the case of a porous soil and sub-soil it seems advisable, in the first place, to put in as few underdrains as possible, and where practicable to lay these under farm roads. It is much easier to add additional drains than to remove existing ones. An underdrainage system is of advantage where there is a large amount of sub-soil water as it is lowered thereby and thus a greater depth of material is obtained to purify the sewage. As a rule all land (excepting clay) should be drained where sub-soil water lies four feet below the surface, and further, underdrains assist in treating the soil.

The experience with draining of clay soils is that it tends to aggravate the deep cracks which always occur in hot weather and as a consequence the sewage runs direct to the drainage with hardly any treatment. A layer of turf, however, tends to ameliorate this tendency. Regarding the distance apart, of feeder and main drains, it depends entirely upon the nature of the soil and sub-soil and the quantity of water to be dealt with. The surface soil acts as a regulator to the rate or filtration per square yard, and in the case of a loose porous soil overlying loose gravel and shingle, the drains will usually have to be laid much closer than in the case of a fine soil.

The distribution of the sewage over the land cannot be too carefully attended to, and it is stated that if the sewage were distributed on land even as approximately and as carefully as on artificial filters greatly improved results would accrue as regards the effluent.

A proper ratio should at all times be observed between the sewage flow carriers and underdrains, having also due regard to the maximum amount of storm water to be dealt with, and at the same time, it must not be forgotten that where settling tanks are not in use, or where the capacity of the tanks is not sufficient that the carriers act largely as settling tanks, and here a certain amount of the sludge is digested and in like manner where the land receives the sewage direct from the carriers it also acts as a settling tank on a large scale.

The report further states a preference for open sewage carriers in preference to piped carriers and they should never be earthen, as each cleaning tends to deepen them and they encourage vegetation and vermin.

Quarterly Report of the Secretary.

CHAS. A. HODGETTS, M.D.

Presented to the Meeting of the Board Held April 25th and 26th, 1905.

The quarter just closed has but few items of importance to which the attention of the Board should be directed. It is gratifying to report that the deaths from contagious diseases show a decrease of 75 over those of the corresponding quarter of 1904, as returned by the Division-Registrars of the Province. The chief diseases showing a marked decline are, Smallpox, from 192 in 1904, to 34 in 1905; and Scarlet fever, from 865 in 1904, to 594 in 1905.

A marked improvement appears noticeable regarding the greater care taken by physicians to comply with the Public Health Act respecting the notification of the following contagious diseases, measles, whooping-cough and typhoid, apart altogether from the fact that in some districts measles have been more prevalent. The notification of Enteric shows some improvement, but there is plenty of room for improvement, as I am satisfied that all cases are not reported to the local Health authorities.

The one black spot in the report is that relating to Tuberculosis, of which 534 deaths are reported; this figure is, however, only a tentative one, actual numbers occurring will be only obtained when the returns of the Registrar-General are made up for the year.

The deaths represent a loss to the Province of more than half a million dollars in three months, and yet but little has been done to prevent or alleviate its ravages.

Owing to this fact, I would, through the Board, direct the attention of Municipal authorities to the opportunity which is afforded to relieve themselves of this stigma by providing one or more free dispensaries where all needy cases suffering at any stage of the disease, could receive not only medical assistance, but through which they could receive that which is of equal importance, as fresh air, viz,—suitable food—chiefly in the nature of milk and eggs, together with instructions as to how to live and to prevent the spread of the disease to those in their own household.

To initiate work of this character would entail but a small cost, and the infinite good it will accomplish in the mitigation of suffering, the alleviation of distress and the prevention of the spread of the infection and often the curing of many, who, but for some municipal aid would speedily pass from friend and home to swell the mighty list of those who have lived and died, sufferers of tuberculosis, and who for the want of municipal aid have bequeathed to that municipality which failed to help them, those they have unwittingly infected with the white plague.

In the interval which it seems inevitable must elapse before Municipal sanatoria are established, I am of the opinion work along the lines just suggested, is the correct one to encourage; indeed, the fact is forced home to a careful student of the question, that it is a part and a very important part of the work, and should be brought more prominently forward than it has been hitherto.

Before leaving the question of contagious diseases, I would refer to the continued presence of Smallpox, which although not quite so prevalent as in the corresponding quarter of the year 1904, is yet with us—a fact which demonstrates the great negligence which exists on the part of the public to conform to the Act which requires them to be vaccinated—Municipalities protest about the expense of smallpox outbreaks, but if the municipal authorities with whom rests the enforcement of the Act, will not avail themselves of its wise provisions, that same authority must be prepared to pay for its neglect of the same—for the Act which requires vaccination of the citizens of this Province is right, because it is scientifically correct, being the greatest propalxis that is known in medicine, and one wherever it is enforced is followed by the most gratifying results.

Since the last quarterly meeting, I have been able to personally enquire into the methods adopted in the cleaning of Sleeping Cars, and would submit a report upon the subject which will be found as an appendix to this report.

The Inspector, Dr. Bell, has made a trip through the lumber districts, and has personally interviewed a number of proprietors of camps, and his report will be presented to you, together with reports of other interesting work done by him in the quarter.

The laboratory work too has been carried on actively by Dr. Amyot, although the report itself will not be so lengthy as many points upon which investigation is being carried on will not be in such a shape as to permit of their being finally reported upon.

As appendices to this report are submitted the following:

(*a*). Report on Epidemic Cerebro Spinal-Meningitis.

(*b*). Pulmonary Tuberculosis in the Provincial Asylums for the Insane.

(*c*). Methods adopted in Cleaning Railway Carriages.

(*d*). Report on Water Supplies of Railways.

(*e*). Report on the Fifth Annual Meeting of the Canadian Association for the Prevention of Consumption, etc.

(*f*). Filtration of Public Water Supplies.

(*g*). Review of Vital Statistics for the year 1903.

Cases and Deaths for Three Months Ending March 31st, 1905.

	1904.		1905.	
	Cases.	Deaths.	Cases.	Deaths.
Smallpox	192	1	34	0
Scarlet fever	865	49	593	36
Diphtheria	938	148	905	129
Measles	112	5	541	11
Whooping-cough	...	29	103	12
Typhoid	89	55	140	54
Tuberculosis	564	564	559	534
Total	2,960	851	2,887	776

1904.		1905.	
Scarlet fever, death-rate	5.8%	Scarlet fever	6.2%
Diphtheria	15.7%	Diphtheria	14.4%

No notification except the deaths.

	Cases.	Deaths.
Smallpox	1 "Soo."	..
Scarlet fever	21	..
Diphtheria	26	2
Whooping-cough	39	3
Tuberculosis	10	10
Total	97	15

Appendices to Secretary's Report.

"A."

Epidemic Cerebro-Spinal Meningitis.

The occurrence of four deaths in the vicinity of the village of South Indian, County of Russell, and the reporting of a case in the village of Exeter, have caused me to prepare the following paper upon this interesting, obscure and fatal disease.

Since 1897, the year in which the Registrar-General made a change in the classification of causes of deaths, there have been 1,140 deaths from this disease in the Province, as follows:—

1897	171
1898	190
1899	214
1900	212
1901	138
1902	101
1903	114
Total	1,140

The provincial distribution of the disease each year is pretty well indicated by that of the year 1903, when the only Counties exempt were Algoma, Dufferin, Haldimand, Haliburton, Parry Sound, Perth, Peterborough, Prince Edward, Renfrew and Waterloo, and as stated in the Report of the Registrar-General the deaths exceeded the combined deaths of Smallpox and Measles.

It may be argued, perhaps with some good claim, that a proportion of these deaths were of tubercular origin and were not true cases of epidemic Cerebro-Spinal Meningitis, be that as it may, we must accept in good faith the returns of the medical men as made to the Registrar-General, particularly as the peculiar and striking chain of symptoms are of such a character as to permit ordinarily of an easy diagnosis.

The history of the four cases just referred to, all of which proved fatal, is briefly as follows,—

1st Case. N. D.—aet. 22 or 23 returned from a lumber camp in Northern Michigan late in December, 1904, being ill, at that time, although the disease was not diagnosed he died a few days after reaching home, with all the symptoms of the disease.

2nd Case. C. D.—eat. 17 sister of the above had been living at a convent in Ottawa and returned to her home (a farm house) the first week of January. She died on Feb. 9th after four days' illness. Her stepmother described her symptoms briefly as follows,—

She was taken suddenly ill with headache and vomiting, this sickness began at 3 a.m. and at 5 p.m.; she was unconscious, not speaking after; spots appeared on body before death.

3rd Case. N. D. Sr.—aet. 49 father of the preceding, was taken ill Feb. 14th, the third day after his daughter's burial, when he was apparently quite well, having driven to his brother's some ten or twelve miles distant, and while visiting there was suddenly taken ill with headache and vomiting, which increased in severity. He became unconscious on the third day of his illness, delirium being marked at times; after this there were slight spells of consciousness, and on the fifth day total unconsciousness occurred, death happening on the seventh day. There was no rash noticeable.

4th Case. P. G.- aet. 25, farmer, nephew of N. D., Sr., and one who assisted in the nursing. The history of this case has been carefully followed by Dr. Boyle, of Casselman, to whom I am indebted for the information. On Feb. 14th he complained of symptoms simulating La Grippe, soreness of the legs, and stopped work. The next day stiffness of the neck was marked as were also the head symptoms, despite the use of salol and phenacetine in 5 grs. doses each, and hypodermics of morphine. When in the erect position the head was forcibly extended and there was diplopia. The pains were also more extensive, being in the knees, legs, muscles and bones generally, also the back. The temperature was 103, pulse fair but variable. The usual remedies were applied, but without any apparent relief, the greatest benefit being obtained from the use of opium and at times he was markedly delirious. On the fourth day the patient became unconscious, his left side was paralized, dark spots appeared some two or three days before he died on the body and legs. The patient died on the tenth day of the disease.

Definition. According to Ziemissin this disease is "an acute inflamation of the piamater of the brain and spinal cord with deposit of a fibro purulent exudation, the infectious character of the disease being shown by its epidemic occurrence, the nature and mode of its propagation and by its course and lesions.

Synonymes. The names given to it in North America, when first it made its appearance were "spotted fever and congestive," while in portions of Europe it was termed 'Cerebro-Spinal Typhus."

History. The first reliable accounts appear to have been recorded early in the nineteenth century, being at Geneva, Switzerland, in 1805. In 1814 an outbreak occurred amongst the French soldiers in garrison at Grenoble, then later in 1837, serious outbreaks were recorded in the soldiers stationed in barracks at Bayonne and Bordeau. Italy suffered from 1839 to 1845, and in the following year outbreaks occurred in different places in Ireland. England was, however, comparatively free from the disease, its chief centre being Liverpool. On this Continent it was first observed at Medfield in the State of Massachusetts, then again in 1842, chiefly, however, during the time of the civil war, Canada being affected chiefly in 1870.

Aetiology. Ziemissin states regarding its atieology, "we still find ourselves in entire ignorance of the original source of the affection. The history of it being given in the Boylston Essay for 1866 by Dr. S. G. Weber, who discussed its relation to other diseases. Perhaps the most modern and scientific report on the subject was made by Councilmen Mallory and Wright to the Massachusetts State Board of Health in 1898, based on the researches made during the winter and spring of '96 and '97, when the disease was then epidemic in the State.

Amongst the early anatomic peculiarities noted were the following,—

(*a*). The character of the exudate.

(*b*). The greater degree to which the spinal membranes were involved.

(*c*). The extension of the inflammatory process to the brain and cord and along the nerves.

(*d*). The absence of inflammatory lesions in the intima of the blood vessels.

The earliest bacteriological investigations were those of Leichenstern who in 1885 found cocci, both singly and in groups, arranged like gonococci in leucocyles, in the meningeal evudate. In the following year Weichselbaum found a diplococcus resembling the gonococcus occurring within the cells only,—this was called the diplococcus intracellulaus meningitidis; these observations were confirmed by other investigations.

Ten years later, 1896, Heubrm found this particular organism in fluid taken from the lumber region, so also Kischensky and Schern in 1895 both found the diplococcus, the former in hemorrhagic foci in the lungs, and the latter in the nasal secretions.

Thus it would appear that the specificity of the disease has been established thus confirming what Zweschentragen wrote some years ago regarding its origin as being due to "a morbific germ," which he says "primarily arises in the human body and infests healthy neighbors only when it has undergone modifications by means of cultivation in suitable intermediate individuals.

Epidemicity, etc. The disease appears most commonly in late winter and spring is generally more prone to attack young adults and children. It does not always appear in epidemic form, and its extension is not continuous. It occurs chiefly in isolated cases and small epidemics, sporadic cases not being uncommon. It would appear to partake of the character of infectious disease in being transmissable, although the channel along which it travels has not been clearly demonstrated.

The chief unsanitary conditions which are certainly contribuatory to its spread are,—the season and weather, sudden and marked changes in temperature together with a high degree of humidity being very pronounced in their effects, and I would associate with these bad hygienic conditions in the dwelling, such as caused by or the accompanyments of poverty, viz,—ill nourishment, damp, overcrowding, bad ventilation and improper food, together with those unsanitary conditions which always conduce to a lower vitality of individuals, unclean grounds surrounding the home whereby the soil becomes littered and saturated with animal exudations and the products of decomposition.

As to the manner in which the disease is transmitted, up to the present the exact channel of communication, has not been definitely determined, but the atmosphere is considered the most likely. I am of the opinion, however, that while the channel may be the atmosphere, yet, it requires that the atmosphere must be of a peculiarly vitiated character, one more or less saturated with noxious poisons, such as would be found in an unsanitary constructed dwelling and made more so by its surroundings, and the outbreak near Casselman, Russesll County, seems to bear out this contention.

In a recent editorial on the subject in the Journal of the American Medical Association the following statement is made,—"a limited number of cases have been placed on record in which more than one member of a family or household has been attacked by the disease," and the recent death of Dr. A. B. Craig, who acquired the disease from attendance on a patient afflicted with it, and the case of Phileas Gaynon subsequently given is one similar in character to this.

Any reference to the symptoms treated and diagnosis of the disease would be out of place in this report. In regard to the latter, however, it should always be confirmed by examination of the fluid (removed by lumbar puncture) for the presence of the "diplococcus intracellularis meningitidis."

Prognosis and Prophylaris. These two points are of interest to the sanitarian,—the death rate being from 20 to 70 per cent. of all cases, and when recovery does occur the sequlæ are often permanent and serious. Owing to its transmissibility the danger from this source should be reduced to a minimum and for this purpose, the patient should be isolated, placing him at the same time in the best hygienic surroundings possible as regards fresh air, light, rest, etc., and at the same time others should be protected by a careful thorough disinfection of all discharges, including those of the ear, nose, mouth and lungs. The bed linen, etc., should be carefully disinfected in a solution of per-chloride 1-1,000 or carbolic acid 1-50 with subsequent laundering, as well as the room occupied and its contents. I would, however, go further and as extra precautions thoroughly clean up and disinfect the house and its immediate surroundings, taking especial care to provide for some system of drainage of the same. Further, where houses are built directly on the earth they should be raised so as to permit of proper ventilation.

In conclusion. I would recommend the placing of this disease upon the list of those requiring notification, and one in which the local health authorities should insist upon the enforcement of the strictest sanitary precautions being taken as to house and premises, isolation and disinfection being certainly required.

If this Board is kept informed of cases as they occur, the medical men could be encouraged to furnish information which would be of considerable interest in solving what is now a question surrounded with some uncertainty, and they should be encouraged to secure specimens of serum and blood for laboratory examination.

"B."

Pulmonary Tuberculosis in the Provincial Asylums.

In reply to a letter of enquiry sent to the Medical Superintendents of the Provincial Asylums for the Insane, I am enabled through the courtesy of these gentlemen to present the following facts, not only as to the number of tuberculosis patients in each institution, but also to place before you the views of those most competent to speak on the question.

The accompanying table sets forth the total number of inmates in each asylum, and also the number of those suffering from the disease, etc., in the month of February, 1905.

	Population of Asylums for month of February, 1905.			Number of cases of Tuberculosis.		
	Male.	Female.	Total.	Male.	Female.	Total.
Toronto	370	368	738			9
London	486	515	1,001			20
Kingston	320	279	599.	14	20	34
Hamilton	476	543	1,019			21
Mimico	294	276	570			2
Brockville	314	319	633			24
Cobourg		146	146			
Penetang	79	109	188			3
Orillia			737	2	5	7
	2,351	2,561	5,649			130

It will thus be seen that there were in the month of February, 1905, 130 cases of Tuberculosis in the Asylums of the Province or 2.2 per cent. of the total monthly population. This, of course, only approximately represents the exact number of cases, for as Dr. G. A. MacCallum, Superintendent of the London Asylum, says, in referring to the number of cases reported, "It is very difficult with the insane without a postmortem to be sure of the diagnosis since they will sometimes pass through the whole course of phthisis without cough or expectoration, and of course they do not often complain."

Of the cases reported I am able through the kindness of the Superintendents of the following Institutions to give the subjoined information as to the stages in which the patients are now suffering.

	Incipient.	Advanced.	Chronic.
Brockville	7	..	17
Kingston	16	5	13
Penetang	2	1	
Mimico	..	2	
Toronto	..	3	6
Hamilton	9	2	10
	34	13	46

and Dr. Norman, Asst. Superintendent of the Orillia Asylum, for Idiots, gives the table of deaths from Pulmonary Tuberculosis in that institution as follows:—

Years.	Deaths.
1902	13
1903	19
1904	17
1905	4 (up to Feb. 18th, 1905).

The population ranged from 675 to 737, which would give an average yearly mortality of nearly 2.5 per cent.

Cobourg Asylum has been particularly free from this disease. Dr. McNicholl reports having had only one case in its history, a patient who died about two years ago, and Dr. Beemer, Superintendent of the Mimico Asylum, attributes the almost entire absence of this disease from the Institution under his care "to the splendid facilities which the cottages afford for the abundant supply of fresh air, which a large portion of the time, owing to the proximity of the lake, is almost dust proof."

This experience is not, however, corroborated by that of the Kingston Asylum, which is perhaps as well situated as that of Mimico, but it must be remembered possibly the fact that greater attention has been given to this particular disease in the latter Institution, may have something to do with there being an increased number at Rockwood. The medical staff is possibly more alert to the diagnosing of the disease from the very fact that there is accommodation for this class of cases. That considerable interest has been manifested is shown from the following extracts. Referring to this important question in the annual report of the Inspector of Asylums for the year 1902, Dr. C. K. Clarke, Medical Superintendent of the Kingston Asylum, says:—"The evils of having tuberculosis patients in general wards are sufficiently apparent without going into detail. Ordinarily we have isolated as many as possible in each Beechgrove Hospital. This summer we went a step further and had a large tent arected for tuberculous men. The results were most gratifying, because we were able to isolate these patients, and to benefit their physical health in such a marked degree." And in his report for the succeeding year the doctor states that, "This season two cottages for men and women were erected in addition to the tents, and the results have been so encouraging that a further extension is recommended." He adds, "The cottages are simple structures, so arranged that those occupying them receive all the benefits to be obtained from the "camping out" plan, indeed, the wooden structures are on the whole to be preferred to canvas tents." As to the benefits derived from thus isolating the patients the Doctor speaks thus:—

"The patients almost invariably improve physically, and being no longer centres of infection in the general ward, it will be possible to do something to stay the ravages of phthisis among the inmates." The illustrations show (1) the tents referred to in the Report of 1902, and (2) one of the cottages used during the summer of 1903.

As to special accommodation for tuberculous insane apart from the placing of the patient in a separate room, or in the hospital where such an adjunct exists, nothing has been done in this Province outside that referred to at Kingston. From the many difficulties surrounding the disease as it occurs in the insane the almost utter impossibility of expecting anything in the way of precautions being taken in the collection and disposal of sputum, and the extreme difficulties surrounding the nursing of acute maniacal tuberculous cases, this question has to be considered from a somewhat different standpoint from that of those unfortunates who are blessed with reason, but who have become infected with the far from blessed bacilli.

One thing is certain and that is emphasized by the fact that many of the insane tuberculous will not take care to dispose of their sputum; these cases must be separated from the others as soon as a correct diagnosis is arrived at, as by so doing the danger of the disease spreading to others resident in the same ward or cottage will be avoided. Once it is decided to separate them then some provision must be made for their care and treatment in a sanitarium. Whether this should be central in character or that each asylum should be provided with a suitably constructed building is a question to be settled. In either case there must be a central building in which acute maniacs could be treated, and annexes should be erected more of the character of a lean too or tent house where those whom it was possible to treat therein could be housed.

In any building so erected greater precautions must necessarily be taken to keep the floors, walls, etc., cleaned and disinfected, as it will readily be imagined there will be less personal care taken of the sputum than would be the case were they possessed of their reason.

Personally, I am of the opinion that a building with tents or tent-huts attached to each asylum would be the best, most efficient and most economical method of handling this class of the insane.

"C."

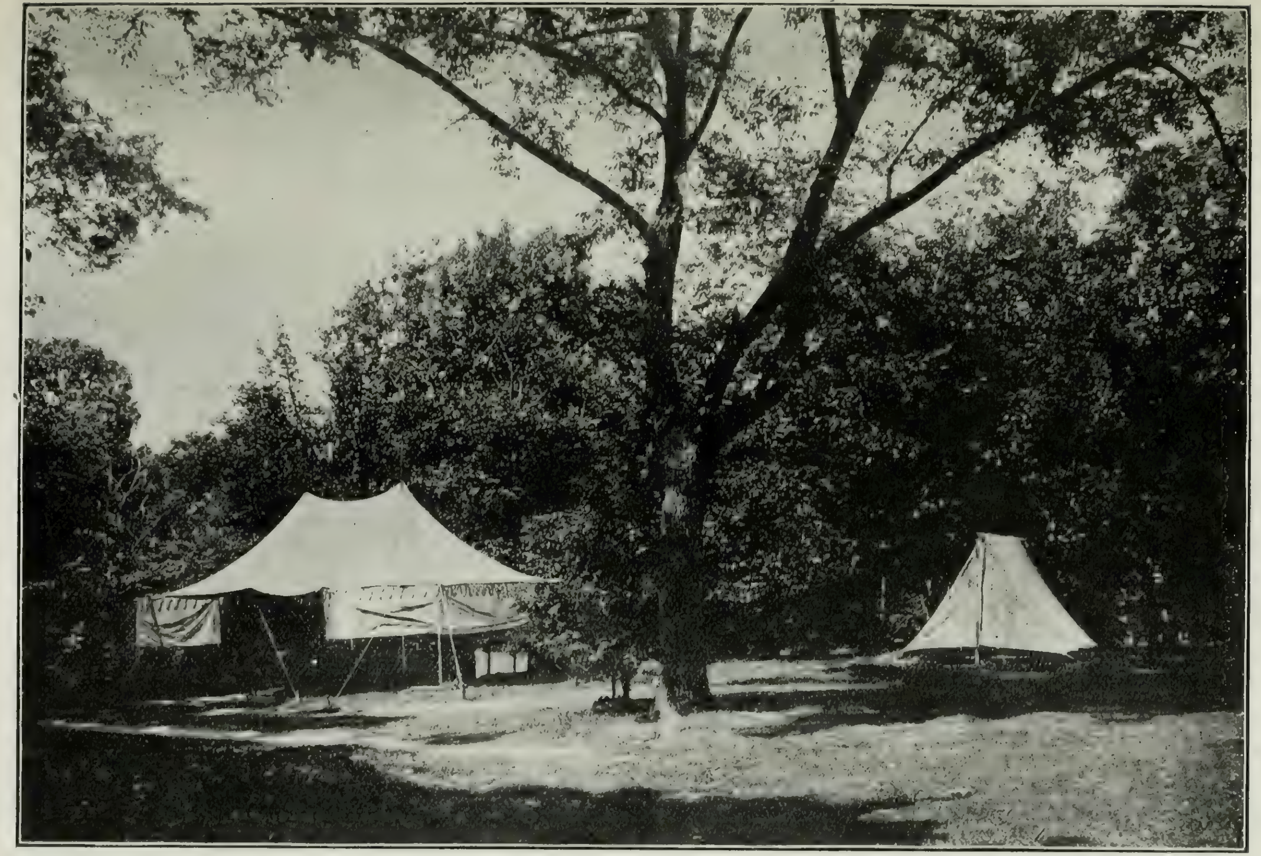
Methods Adopted in Cleaning Railway Carriages.

At a previous meeting of the Board I had occasion to bring to your notice the necessity which existed for some enquiries being made regarding the cleaning of railway carriages and sleeping cars, with a view to this Board considering the advisability of making regulations for the better sanitation of the same.

I beg to report having conferred with Mr. W. A. Ritchie, District Superintendent of the Pullman Co., Montreal, and Mr. G. Brown, Superintendent of the Sleeping Car Department of the C. P. R., Montreal, and through their kindness every opportunity was afforded me to observe the daily routine work carried on by both Companies in that City, and for a better understanding of the same would speak of each separately.

Pullman Sleepers. The terminals in which this Province is most interested are those of Montreal, Province of Quebec, on the eastern boundary, and Detroit, Michigan, on the western, as there are none in this Province, and it is only at terminals that the method described is carried out.

A carriage after completing its trip is stripped of everything moveable including seats, backs, pillows, mattresses, blankets, berth curtains, etc.,



Tents for tuberculosis patients, Rockwood Hospital for Mental Diseases.

Cottage for tuberculosis patients, Rockwood Hospital for Mental Diseases.

which are cleaned by being blown with compressed air, and the whole interior of the car is blown out in a similar manner before the furnishings are replaced. In this manner the dust and most of the dirt are removed from the cars and bedding, etc. To accomplish this work requires the services of four men to each car, and two or three gangs are kept constantly employed at the terminals. Should the car be kept at the terminals for any length of time the upper berths are let down and the car is kept aired, and it is often subjected to a blowing out just before being put in commission.

When carriages which run on lines passing sanatoriums, and are liable to carry passengers affected with tuberculosis, as for instance in the Saranac region, the conductors on these trains report at the terminals (under a severe discipline penalty, if neglected) all cases of sickness noticed on the cars. Whether cases occur or no the car is fumigated with formaldehyde sprinkled on sheets hung therein, the cuspidors and hoppers being disinfected with the same preparation, the car itself being kept closed for six hours, after which it is aired and made ready for the reception of passengers. If a case is reported special attention is directed to the accommodation so occupied, the entire bedding being removed, the mattress being wrapped in a sheet which had been previously sprinkled with formaldehyde and left for twenty-four hours at least, after which it is exposed to the air. The blankets are also disinfected and sent to the mills to be scoured and clean bedding is put into the accommodation. At stations other than terminals the rule is for the upper berth to be let down and the lower ones opened up and aired.

As one of the chief difficulties complained of by the travelling public is the danger that exists from the infection of blankets, I might with interest to the public, describe the new rules in the making of beds:—

Three clean freshly laundered sheets are now used, one being placed on top of the mattress, being tucked well under it. The second is placed on top of this and then the blanket, the third sheet being the top covering. This sheet is nine feet long, thus allowing of the folding of the same for about two feet over the top or head end of the blanket, this top sheet being tucked in so as to overlap the second, the object being to make it impossible for the blanket to touch the person at any part.

At Montreal great care is taken in the handling of the linen, which upon being received from the laundry is inspected by a woman who rejects all soiled or stained linen which she considers improperly washed. It is then placed in white enamelled lockers in the linen rooms, which are air tight and as secure as possible from dust. Specially made heavy duck bags are used for the transporting of the linen. It is also the duty of this official to inspect all linen sent to the laundry, and that used in the beds occupied by sick persons is kept separate and disinfected before being sent to the laundry.

The towels supplied need not be referred to, as it is well known that the individual system is in force, the roller towel having been long ago discarded.

Recently the Company has introduced what they term "individual" cakes of soap, the object being to permit of each passenger having a fresh cake, but to carry this out it is essential that at least an equal number of fresh cakes be provided as there are passenger on each car, if it is to be of any use, and the used cakes at once replaced by a new one.

The ice used for drinking purposes is carried to each car in a special bucket, which is part of the outfit of each car and is not used for any other purpose.

The closet now standard in the Pullman service is the "Duner Car Closet," which is a combined water and dry closet made of enameled iron in two separate hoppers, detachable for cleaning.

The C. P. R. Methods. Through the kindness and courtesy of Mr. Brown, Superintendent of the Sleeping Car Department, I was enabled to examine into the methods upon which this Company cleans the coaches. A car making the trip, for instance, from Vancouver to Montreal, is cleaned at the latter terminal in the following manner,—

(*a*). It is first stripped of everything moveable, and virtually the only thing not wood or metal non-removable are the plush arm rests.

(*b*). It is then thoroughly swept and brushed out

(*c*). After which it is blown out by means of compressed air.

(*d*). In the meantime the equipment, which as just stated has been removed, is put through the same process.

(*e*). The car is then washed inside and out.

(*f*). Once a fortnight each car is fumigated with formaline by means of a generator.

The rules in force by this Company require the porters, conductors, agents and district superintendents to report all cases suspicious of being ill, and even if a doubt exists the compartment occupied by this person is closed. The equipment, however, is first removed, and in the case of the illness being a serious contagious one, the bedding is destroyed.

It will thus be seen that both Companies are honestly endeavoring to meet the demand of health authorities and of the public for improved methods in the sanitation of sleeping cars, and as an indication of this fact I am pleased to state that quite recently (May 1904) Dr. Thomas Crowder was appointed Superintendent of Sanitation by the Pullman Company with the head office in Chicago.

Mr. Brown, of the C. P. R., informed me that his Company had been making experiments as to the greater efficiency of the vaccum process of cleaning cars over that of compressed air which is now in use, and he assured me its efficiency had been demonstrated and it would shortly be adopted by his Company at the cleaning depot which would be established in Montreal.

It is the custom of both Companies to have the blankets washed at the mills at stated intervals, but apart from the blowing process and a slight fumigation they receive in the interval nothing further is done with them.

In conclusion, I would point out some of the weak points in the present system as viewed from a sanitary standpoint, and at the same time indicate some of the measures which could be adopted for the efficient disinfection of carriages and their fittings without materially increasing the cost of the work, but possibly resulting in the saving of considerable time and labor.

The cleaning by compressed air is most objectionable, as it not only exposes those employed, but it scatters any disease germs that would otherwise lie quiescent. The process should be superceded by the vaccum one, or some such similar method.

The greatest difficulty is in the use of the blankets. They are certainly cleaned each time they are returned from the mills, but the night of their first use thereafter they may become the abode of disease producing organisms, and they remain more or less so until cleaned again. Further, the process to which they are submitted in the mill tends to harden and their durability is decreased accordingly.

The erection at each terminal of a steam sterilizer of sufficient capacity to contain all the moveable fittings of the car, would permit of the effectual destruction of any pathogenic organisms. These fittings can be placed in wire trucks or carriages, fitted with handles at both ends, which vehicles when filled with blankets, pillows, fittings, etc., could be drawn to the sterilizer, run in and submitted to the action of the super heated steam, and when dry run back to the car and replaced.

In addition to these terminal sterilizers there should be others smaller in capacity, one at each point, where cars are detained, and the Companies should be required to furnish the conductor, or official in charge of the car, with a certificate stating when and where the car was last cleaned and its contents sterilized, a penalty being inflicted if such is not forthcoming.

I am pleased to state that the two gentlemen referred to in the early portion of this report, when this suggestion of sterilizers was made to them and explained, both expressed their approval of the suggestion, and I feel certain through their representation something will be done along these lines.

"D."

Report on Water Supplies of Railways.

In considering the question of water supply on Railway trains, two classes of persons have to be considered, viz: the public and the employees, and the question will be considered from these two standpoints; before doing so, however, I would express my thanks to the Superintendents and Managers of the Railways operating in this Province for the kind and courteous manner in which they have taken up the question, and for the careful and painstaking manner in which they have made their enquiries; and also would assure the public that in every instance I was assured of the great importance each company places upon "the water supply upon trains generally, whether they be passenger or freight."

In reply to enquiries sent out, reports were received from thirteen Companies, the summary of which is as follows:—

The Public Supply.

Railway Company.	*Source.*
Toronto, Hamilton and Buffalo	City and town waterworks.
Brockville, Westport and Northwestern	Brockville, waterworks. Westport, well.
Irondale, Bancroft and Ottawa	Springs at Baptiste Station.
Central Ontario	Springs at Trenton, cooled with ice from Bay of Quinte.
Bay of Quinte	A good well at each station carefully looked after.
Niagara, St. Catharines and Toronto	The city water systems on line.
Wabash	The public water systems of Detroit, St. Thomas, Niagara Falls, U.S., and Buffalo, N.Y.
Pere Marquette	Four public water systems, London, Walkerville, Sarnia and Chatham.
Canada Atlantic	90 per cent. from Ottawa system. Ice—Ottawa River. Swanton, Vt., U.S.A., public system. Coteau, De Lite River, Hawkesbury, town system and Ottawa River. Rockland, town system. Pembroke, town system. Madawaska, Madawaska River. Depot Harbor, Georgian Bay.
Ottawa and New York	Ottawa and Tupper Lake, N.Y., public systems.
Canadian Northern	Special tanks along the line.
Grand Trunk Railway	

15TH DISTRICT.

Station.	*Place from which water is obtained.*
Toronto	Municipal water works.
Toronto Junction	Toronto Junction water works.
York	Creek, source of water supply for East Toronto.

16TH DISTRICT.

Section.	*Place from which water is obtained.*
Hamilton	Lake Ontario
Swansea	Toronto Junction water works.

17TH DISTRICT.

London	Springs five miles west of the city.
Niagara Falls	Water is pumped from rapids above the falls into mains throughout the town.
Sarnia	Lake Huron.
Sarnia Tunnel	Lake Huron.

18TH DISTRICT.

Windsor	Detroit River.
Grand Trunk Railway	Water supplied to passengers and employees.

15TH DISTRICT.

Weston	Company's well.
Malton	From well on company's property.
Brampton	From company's well.
Norval	From well on company's property.
Georgetown	From town service, water works system, gravitation from reservoir. Spring water.
Limehouse	Supplied from mineral spring.
Acton	From company's well.
Rockwood	From well.
Guelph	Water supplied to passenger station is pumped from the river Speed. Water supplied freight shed and office employees is obtained from wells.
Breslau	From company's well.
Berlin	Water supplied by water works, pumped from artesian wells.
Blair	From hotel pump.
Doon	From well.
Waterloo	From town water works which is obtained from wells.
St. Jacobs	From well.
Elmira	From company's well.
Petersburg	From well.
Baden	From hotel pump.
New Hamburg	From company's well.
Shakespeare	Company's well.
Stratford	Company's well.
St. Paul's	Company's well.
St. Mary's	Company's well.
Thorndale	Company's well.
Cranton	Company's well.
Lucan	From wells in vicinity of station.
Ailsa Craig	Company's well.
Park Hill	Company's well.
Thedford	Company's well.
Forest	No water used.
Camlachie	From neighboring well.
Blackwell	No water used.
Hagersville	From neighboring well.

20TH DISTRICT.

Buffalo	From Buffalo city water works, from their pumping station, Niagara River.
Fort Erie	From water works, ex. Niagara River.
Ridgeway	From well.

20th District.—Continued.

Section.	*Place from which water is obtained.*
Dunnville	From water works, ex. Grand River.
Canfield	From well.
Caledonia	From hydrant, pumped from river.
Onondaga	From well.
Brantford	From Brantford water works.
Drumbo	Company's well.
Bright	From well at hotel.
Tavistock	From well.
Sebringville	From company's well.
Mitchell	Company's well.
Dublin	Company's well.
Seaforth	Company's well.
Clinton	From company's well.
Goderich	From water works, pumped from Lake Huron.

21st District.

Port Dover	From town.
Simcoe (21st Dist.)	Company's well.
Port Dover Junction	From neighboring well.
Otterville	From well.
Norwich Junction	From well.
Norwich	From well.
Burgessville	No water used.
Hickson	Company's well.
Vittoria	Company's well.
St. Williams	Company's well.
Port Rowan	Company's well.

22nd District.

Branchton	From company's well.
Galt	From artesian wells.
Preston	From company's well.
Hespeler	From spring.
Elora	From neighbor's well.
Fergus	From spring through tank house.
Alma	Company's well.
Goldstone	Company's well.
Drayton	From company's well.
Moorefield	From hotel well.
Palmerston	From reservoir at company's pumping station.
Mount Forest	No water used.
Holstein	Neighboring wells.
Durham	From well.
Harriston	Company's well.
Clifford	Neighboring well.
Mildmay	Neighboring well.
Walkerton	From well through water works.
Cargill	From well.
Pinkerton	From well.
Paisley	From neighboring well.
Port Elgin	From well.
Southampton	From company's well.
Ayton	Company's well.
Neusteadt	Neighboring well.
Hanover	Neighboring well.
Elmwood	Neighboring well.
Chesley	From well.
Tara	From open spring.
Allenford	From well.
Parkhead	From company's well.
Shallow Lake	From well.
Owen Sound	From spring.
Hepworth	From well.
Wiarton	From the bay.

23rd District.

Section.	*Place from which water is obtained.*
Milverton	Neighboring well.
Newton	No water used.
Listowel	Company's well.
Cowanstown	Company's well.
Attwood	Company's well.
Ethel	Company's well.
Brussels	Neighboring well.
Bluevale	Neighboring well.
Wingham	Company's well.
Whitechurch	Company's well.
Lucknow	Neighboring well.
Ripley	Company's well.
Kincardine	From spring.

24th District.

Ilderton	Company's well.
Denfield	Company's well.
Clandeboye	Company's well.
Centralia	Company's well.
Exeter	Company's well.
Hensall	Neighboring well.
Kippen	Company's well.
Brucefield	From well.
Londesboro	Company's well.
Blyth	From well.
Belgrave	Company's well

Canadian Pacific

Smith's Falls	Town supply.
Carleton Junction	Mississippi River.
Ottawa	City water works.
Havelock	Well.
Toronto	City water works.
Toronto Junction	City water works.
Hamilton	City water works.
St. Thomas	City water works.
London	City water works.
Chatham	City water works.
Windsor	City water works.
Owen Sound	City water works.
Teeswater	Well.
Elora	Well.
North Bay	Town supply.
Sault Ste. Marie	Town supply.
Chapleau	Lake Kabequashesing.
Schreiber	Outlet of Cook lake and spring near pumping station.

Source of Water Used on Engines Only.

Toronto, Hamilton and Buffalo	Company posted notices May 7th, 1903, to employees not to use water from tanks, as in some instances a chemical was used to soften it.
Brockville, Westport and Northwestern	Brockville water works. Westport, wells
Irondale, Bancroft and Ottawa	Springs at Baptiste station.
Central Ontario	Tanks, fed with river water or creeks.
Bay of Quinte	Fine well found at each station.
Niagara, St. Catharines and Toronto	The city water systems on line.
Wabash	Four public systems at Windsor, St. Thomas, Niagara Falls and Fort Erie.
Pere Marquette	Public systems of London, Walkerville, Sarnia, Chatham and tanks on line.
Canada Atlantic	90 per cent. of supply from Ottawa, also from tanks on line.

Source of Water Used on Engines Only.—Continued.

Ottawa and New York	Ottawa system. Tupper Lake, N.Y., system. Springs at Kildan, N.Y., Madawaska, N.Y., Santa Clara, N.Y., and St. Regis Falls, N.Y., and a brook at Morra, N.Y., Finch and Russell.
Canadian Northern	Tanks along the line. Engines provided with water kegs, and cabooses with water barrels for drinking purposes.
Grand Trunk	Same source as that given for public supply. Engines also take water at tanks along the line.
Canadian Pacific	Same source as given for public supply, and engines take from tanks on line.

From these tables, it will be noted that the chief source of supply of the water used for drinking purposes, is derived from Public Systems, but in some instances, particularly in the case of the Grand Trunk, well water is used.

As to the freedom of both these classes of water from pollution, the public at present have no guarantee—and as to their potability, it can only be said that those derived from the Public Supply alone, have the approval of the Board—the others should certainly be examined with a view to ascertain their purity. The method also in which it is carried should be considered.

Of the character of the waters supplied to the engines, that is a matter which concerns only the Railway Companies, but the protection of the employees and general public against their use is one that certainly comes within the range of this Board.

I would therefore recommend that for the better protection of the travelling public and railway employees, this Board require the bacterial analysis of all water supplies used on railroads in this Province, and that only those approved by this Board be used for drinking purposes. Further, the water receiver in each car should be so constructed as to prevent the possibility of passengers or others removing the same, and to this end the receiver should either be concealed, or the top kept locked. For the preventing of the use of waters intended for engine and boilers only, a notice to the effect that "this water is not intended for drinking purposes"; possibly is polluted, and the person drinking the same is in danger of suffering therefrom, should be attached to all tanks and at all outlets where there is any possibility of the same being used for drinking purposes—and further, similar notices should be posted up in all engines, to serve as a warning to employees. The company being further required to provide a suitable resceptacle for drinking water in each engine.

"E."

Report of the Fifth Annual Meeting of the Canadian Association for the Prevention of Consumption and Other Forms of Tuberculosis.

The numbers in attendance at the meetings of the Association were in marked contrast to those of the previous year, and were an indication of the deep interest taken in the subjects dealt with by the Association.

The spirit of enthusiastic hopefulness which characterized the meeting was no doubt in a large degree attributable to the gratifying reception accorded in the Dominion House of Commons, to the following Resolution introduced by Mr. George H. Perley, Member for Argenteuil, on February 20th, 1905.

"That in the opinion of this House the time has arrived when parliament should take some active steps to lessen the wide-spread suffering and the great mortality among the people of Canada, caused by the various forms of tuberculosis."

Which resolution was seconded by Dr. T. G. Johnson, Member for Lambton, and supported by representatives from all portions of the Dominion, and among them, the Hon. Sydney Fisher, Minister of Agriculture, Sir Wm. Mulock, Postmaster-General, and by Mr. R. L. Borden, leader of the Opposition, and ultimately agreed to.

The following is an extract from the report of the Secretary, Rev. Wm. Moore, D.D., and will indicate the lines upon which the Association has been working during the year 1904.

"At the meeting of the Association last year a resolution was passed to the effect that co-operation be secured in petitioning the Federal Government, urging that at least one sanatorium be established in each province. Dr. Bryce was convener of the committee which had the work in charge. Favorable replies had been received from all parts of Canada. From British Columbia no fewer than 24 petitions have come in. The municipalities of Manitoba have taken steps towards raising money for a sanatorium in that Province, hoping of course to get financial assistance from the Dominion Government. The main work of the association in the past year had been an educational propaganda. Rev. Dr. Moore delivered 14 lectures in Ontario, 11 in Prince Edward Island, 9 in Nova Scotia and 2 in New Brunswick. The reports, literature, etc., sent out by the association in the past eleven months amounted to 750,000 pages.

"The report referred in appreciative terms to the resolution which Mr. George H. Perley introduced in the Commons."

"The Secretary further reported that in pursuance of the resolution passed at the previous meeting on motion of Sir James Grant, urging a medical examination of school children, letters had been sent to the different ministers of education, but no move towards having the work carried out has apparently been made." From which it will be seen, through the aid granted by the Dominion Government considerable work has been done in the Easter portion of the Dominion, and further, that the publication and distribution of literature is being actively carried on.

The most important item of business was the discussion on the following Resolution, which was moved by,

Sir James Grant, Ottawa, and
Seconded by Mr. G. H. Perley, M.P.

"WHEREAS the following Resolution was agreed to unanimously by the House of Commons on 20th February, 1905, namely: That in the opinion of this House the time has arrived when parliament should take some active steps to lessen the widespread suffering and the great mortality among the people of Canada caused by the various forms of tuberculosis."

"It is hereby resolved that this Association do now and hereby respectfully petition the Dominion Government to take such action as may be expedient to constitute a Royal Commission with authority to enquire into and report upon what active steps should be taken to lessen the widespread suffering and the great mortality among the people of Canada caused by the various forms of tuberculosis."

"It is further resolved that a special committee be appointed by the Executive Council of the Association to forward this matter."

This Resolution was supported by many speakers and adopted unanimously.

The evening session was held in the lecture hall of the Normal School, under the patronage of His Excellency Earl Grey, when Professor Adami, of Montreal, delivered an address on "Adaptation and Tuberculosis."

In putting a motion conveying the thanks of the meeting to the lecturer, His Excellency Earl Grey made an eloquent and very interesting speech, praising the splendid effort of Dr. Adami and supporting in every particular the good work of the society. He quoted the words of the King: "If consumption is preventable, why not prevented?" and went on to say that if tuberculosis is easier to eradicate than leprosy, then all the blame rested upon the people that it was not eradicated. He deplored the great annual loss of life through the ravages of this terrible scourge, and stated that the spread of hygienic knowledge and the establishment of sanatoria were the two great means of stamping out the disease. He regretted that the lecturer limited Canada's lead to prevention of the disease in cattle and thought this might be extended to the disease in human beings, saying, "Canada with her glorious climate, which is a natural disinfectant, should be the first to lead the way."

The following were elected as officers for the current year.

Hon. President—His Excellency Earl Grey.

Hon. Vice-Presidents—Sir Wilfrid Laurier, Lord Strathcona, and the Lt. Governors of the different Provinces.

President—Senator W. C. Edwards.

Hon. Treasurer—J. M. Courtney.

Secretary and Organizer—Rev. Dr. Wm. Moore.

Executive Council elected by the Association:—

Messrs. Bishop Hamilton, Ottawa; Dr. Chas. A. Hodgetts, Toronto; Dr. Adami, Montreal; Dr. Lachapelle, Montreal; Dr. Botsford, Moncton, N.B.; Lawrence, Truro; Dr. J. G. Toombs, Mt. Stewart; Dr. Gordon Bell, Winnipeg; Dr. J. D. Lafferty, Calgary; Dr. C. J. Fagan, Victoria, B.C. Ten more members of the Executive Council will be named by His Excellency the Governor-General.

At the meeting of the Executive Council held the following day, it was arranged that a meeting would be called about the middle of April to consider the appointment of a Special Committee to petition the Dominion Government in the manner suggested by Sir James Grant's resolution.

"F"

The Filtration of Public Water Supplies.

The necessity which exists for the permanent protection of the consumers of public water supplies against diseases of a water borne origin, more particularly Enteric Fever, has led me to direct your attention to the advantages to be derived from the introduction of some form of filtration, whereby disease producing organisms are removed before the water reaches the consumer, and in this manner the public have a guarantee, possibly the best guarantee that santiarians know of, that there is a certainty of the water consumed by them being pure at all times.

As the situation now presents itself in this Province there is a possibility, an ever increasing possibility of such a danger arising to most of the municipal systems, and the average thoughtful citizen must live in dread of such a contingency for it may and will arise, more particularly at certain seasonal periods, and when it does occur there is no possible manner of determining it so as to stop the consumption of the water in time to prevent infection, hence as a result, considerable trouble and suffering may follow by reason of an outbreak of Enteric Fever or intestinal complications.

After the public have consumed the disease polluted water the bacterielogist will tell you, if he has been fortunate to secure a sample at the right time, that it was an "unsafe water," or "one containing suspicious pathogenic organisms," small comfort when these same organisms at that moment are in your system and have begun their dread work. I would not wish to be thought as casting reflections on bacteriological work—it is excellent—and most useful in demonstrating that a water supply is contaminated or no at the time a particular sample or series of samples are taken when the contamination is first detected. It is a means of pursuing investigation and determining when the pollution ends, and the water may again be considered potable.

But it is not enough to have only partial protection, what is required is a preventative measure such as can only be found in filtration, and at the present I would deal simply with that method known as slow sand filtration.

Among the great works of the world that of the City of London, England, which has for its object the impounding of water in South Wales includes a system of filters through which it will be passed before reaching the metropolis. In a similar manner the Liverpool system which has for its source the impounded waters of Lake Vymeoy, North Wales, has a series of filters through which the water passes, and also the Birmingham system gathered also in Wales provides for filtration. Among European cities might be mentioned Berlin, Warsaw, St. Petersburg and Hamburg where sand filters are in use.

That Ontario cities may form some idea of how this system of sand filtration is operated, the probable cost and the benefits resulting therefrom, I have pleasure in presenting a short description of the Belmont Filtration Works which, through the courtesy of Mr. John W. Hill, Chief Engineer of the Bureau of Filtration of the City of Philadelphia, I have recently inspected. The Belmont works are situated close to the city limits on a tract of land some sixty acres in extent and they supply filtered water to West Philadelphia, which has an estimated population of 170,000. The works are not yet completed, but at the time of my visit the portion in operation consisted of

(*a*) the sedimentation basin,
(*b*) the clear water basin.

(*c*) plain sand filters,

(*d*) preliminary filters,

of which the following are the details.

The capacity of the two subsiding basins at flow line is 36 million gallons, which at the present rate of consumption represents 2.40 days sedementation before it is drawn off.

There are eighteen plain sand filters modeled after the filters at Berlin, Warsaw, St. Petersburg and Hamburg.

The preliminary filters operate at a rate of 80 million gallons per acre, the clear water basin is 15 feet deep with a capacity of sixteen and a half million gallons. In addition to the above there are eight hopper sand washers with direct acting plunger pumps to supply water under pressure to the sams. The pumping station contains a centrifugal pump to supply wash water to the preliminary filters, steam boilers and an electric lighting squipment.

The chief points of interest to which I wish to direct attention are the,

(1) Sedementation Reservoir.

(2) The sand filters.

(3) The clear water basin.

(4) The sand ejectors and washers.

Sedementation Reservoir. This consists of two divisions or basins each 25 feet deep at the flow line, and 29 feet deep from the top of the embankment. The area at the former being 5.33 acres. In the division wall between the two basins are placed two equalizing or pass pipes, which, when the valves are opened, permit of a uniform elevation of the water surface in both divisions of the reservoir. Each of these pass pipes is supplied with a floating inlet pipe which receives the water at the surface of the reservoir and conducts it to the pass pipe, and so to the opposite division where it is discharged at the bottom of the basin.

The subsided water is conducted from either division to the screen chamber and from thence to the preliminary filter through one or more of three sluice gates provided for this purpose. The plan of the influent and effluent pipes as they pass through the gate-house is such that the raw water may be delivered entirely into one division and drawn from the other; or may be delivered into one drawn from each division at the same time, or one basin may be cut out altogether, or one of the two supply pipes entering the gate house will supply into both or either division and likewise the subsided water can be diverted into either of the two 48-inch effluent pipes.

Preliminary Filters. The preliminary filters consist of 20 concrete tanks each 60x20 ft., and 8ft. 6in. deep. In the bottom of each tank is first placed 12 inches of gravel ranging in size from two and half inches to one quarter inch in diameter, above this a layer of coarser sand 30 inches deep consisting of grains that will pass a No. 6 sieve and be retained in a No. 30.

The water from the subsiding basins is introduced at the top of the filters and percolates at a high rate downwards through the material described above, ultimately finding its way to a main collector at the centre of the filter thence out of the filter over a measuring and regulating weir to an open duct built of concrete which conveys the rough filtered water to the 4.8 inch iron supply pipe of the sand filters.

To provide for the washing of these preliminary filters, a system of wash pipes consisting of two lines of twelve inch main pipe from each of which 2 inch branch pipes placed on 8 inch centres, entered right and left under the sand bed at a level of the gravel layer to the opposite main pipe.

These pipes are perforated on the upper side and water at a head of fifty feet is used to wash the bed by reverse current, and an experience of eighteen months with an experimental 10ft. mechanical filter leads to the belief that this method will restore the sand bed to its normal condition at less cost than by the use of mechanical agitation.

The purpose of these filters is primarily to enable the plain sand filters to operate at a higher rate than has heretofore been employed, and correspondingly reduce the acreage of filter surface required to treat the whole water supply.

Secondly, to prolong the life or rather increase the yield of the plain sand filters between scrapings from 60 to 70 million gallons per acre to 90 or 150 per acre.

Thirdly, to maintain a more regular effluent than is possible with the plain sand filters when supplied with water which has been under either quiescent or continuous subsidence for a day or so.

The preliminary filters will perform in a short time what could be accomplished only in a very long time by sedementation reservoirs.

Plain Sand Filters. The eighteen filters are of the following dimensions,

7 filters 242 feet 2 in. x 135 feet 5 in.
8 " 272 " 8 " 120 " 2 "
3 " 196 " 5 " x 165 " 11 "

being arranged thus to suit the plain and contour of the land.

All the filters are covered, the roof arches being carried on monolithic concrete piers 30 inches square at the base and 22 at the top. Over the arches of the filters there is placed a layer of 24 inches of earth to protect both water and sand beds in winter and summer. The six lines of cast iron water pipe to each filter are as follows.—

(1) Influent pipe to supply water to filter.

(2) Effluent pipe to conduct the filtered water away.

(3) Refill pipe to refill filters from below with filtered water after scraping the sand bed.

(4) Raw drain pipe to draw off the water from above the sand line.

(5) Drain pipe to draw off the water from below the sand bed and conduct it to the sewer.

(6) High pressure pipe to supply water to the sand ejectors.

The Filters. In the centre of each filter is placed a main water collector into which at intervals of 15 feet are connected the lateral collectors, which consist of a line of 8 inch vitrified pipe perforated all around from end to end and plugged at the end remote from the main collector.

Around the collectors and for a height of 6 inches from the floor is placed gravel ranging in size from 3 inches to one and three-quarter inches in diameter. Above this is placed a 4 inch layer of gravel ranging in size from 5-8 inch to 1-4 inch in diameter. Above this is placed a 2 inch layer of gravel ranging in size from 1-4 inch in diameter to material which would be retained in a sieve having 14 meshes to the linear inch, and above this is a final layer one inch thick of coarse sand which would pass a No. 14 sieve and be retained in a 20 sieve.

It will thus be seen that the whole depth of underdrain gravel is 16 inches, and above this is placed the bed of sand to the depth of 36 inches, and it possesses the following physical requirements. No particles are intercepted by a No. 6 sieve, and but few pass a No. 60, thus having the Massachussets State Board of Health standard.

In the institution of the Belmont plant the sand was placed at different depths in order that the time of their going out of service for resanding would not occur to more than one or two filters at the same time, thus,—

3 filters receive 28 in. sand.
3 " " 31 " "
3 " " 34 " "
3 " " 37 " "
3 " " 40 " "
3 " " 43 " "

or an average of 35.5 inches.

The Clear Water Basin. This basin is constructed of concrete and has a capacity of over 16 million gallons.

To one other important matter of this interesting and important system I would briefly refer, and that is the sand ejections and washers whereby the sand which is raked off the filters is removed.

Two lines of water pipe are connected by ordinary fire hose to the Korting ejector. It weighs only 160 pounds and is easily worked by two men. In practice the sand is scraped in a heap in each bay of the filter and the ejector located so as to connect at one setting twelve or more heaps. One ejector throws out 6 to 8 cubic yards of dirty sand per hour and in the progress through the discharge pipe about one half of the washing process is accomplished by the time it arrives at the washer. Thus is accomplished in the same length of time the work of over 20 men with wheelbarrows.

As an evidence of what has been accomplished by this filtration of Scheylkill River, I have much pleasure in submitting the accompanying tables kindly furnished me by Mr. John W. Hill, Chief Engineer of the Bureau of Filtration, from which it will be seen that Enteric Fever has almost entirely been prevented in West Philadelphia, indeed allowing for the possibility of those persons attacked with the disease, having contracted it by taking of city water while employed in other portions of the city not so fortunately situated, it may be said to be non-existent in that borough, a fact which one is not surprised at when the purity of the water is considered as given in table 2.

"G."

Review of Vital Statistics for the year 1903.

As it is the duty of this Board to study the vital statistics of the Province (Section 9 Public Health Act) I desire to present for your consideration the following data taken from the Report of the Registrar-General for the year 1903, which has recently been presented to the House of Assembly.

The total number of deaths recorded in the year and registered in the Department were 29,664 (including still births) equal to a death rate of 13.4 per 1,000 of the population, a figure which is very satisfactory when compared with the death rate of adjoining States and with those of Great Britain.

It is noticeable that the counties in which are situated the largest cities and towns show a death rate in excess of the average:—Carlton, 17.4; York, 17.0; Frontenac, 16.1; Peterborough, 14.8; Wentworth, 14.6; Middlesex, 13.7, while the city death rates which are founded upon more accurate returns show a death rate of 17.4 per thousand, the highest city death rate being that of Ottawa, where it was 20.9 per thousand.

The custom of the Registrar-General has been to include still births in the tables of both births and deaths, hence in comparing the death rate in Ontario with those of other countries, this fact must not be lost sight of. Of the total deaths recorded, I would point out that 8,634 or 29.1 per cent. happened before the fifth year of life and 6,700 of this number or 22.5 per cent. of the total occurred in the first year of life as follows:—

a.	Communicable Diseases	297
b.	General Diseases	166
c.	Disease of the Nervous System	616
d.	Disease of the Circulatory System	11
e.	Disease of the Respiratory System	663
f.	Disease of the Digestive System	996
g.	Disease of the Genito Urinary System	23
h.	Puerperal Diseases	1
i.	Diseases of the Skin	13
j.	Diseases of the Locomotor System	4
k.	Malformations Disease of Infancy	3,857
l.	Accidents	36
m.	Ill defined causes	17
		6,700

including still births 1,266, and of this infantile death roll there died in the urban municipalities, 3,224 or 48.4 per cent. and in rural municipalities, apart from the city and town groups, 3,456, or slightly more than one-half.

It will be observed that the death rate from contagious diseases compares most favorably with that of the other groups, only 297 deaths occurring in infants under one year of age out of a total 6,700, is satisfactory especially in view of the fact that more than twice that number dies in the groups Nervous and Respiratory Diseases, and more than three times the number from diseases of the digestive system. This fact would seem to indicate the necessity there exists for parents being instructed in the proper methods to adopt in the artificial feedin gof infants and the care that should be taken preservation, preparation and administration of milk. The subject is one that might very properly be considered by this Board, for without education we can hope for but little improvement in this direction. The annual sacrifice of innocent infants upon the altar of ignorance will, undoubtedly, continue if some such coarse is not adopted.

Deaths by Disease Groups. The deaths from communicable diseases were as follows for all ages:

Enteric Fever	391
Smallpox	21
Measles	55
Whooping Cough	204
Scarlatina	580
Diphtheria	687
Influenza	259

The most marked increase in this group was shown in scarlatina, the deaths being 64.2 per cent. greater than in 1902. It is particularly gratifying to note the influence of hospital treatment as shown in the Ottawa figures, in which city nearly all cases were removed to the Isolation Hospital, the deaths in 1902 were 39 and in 1903 only 6.

General Diseases. The most important increase in this group is tuberculosis, and a table is given showing the deaths reported in the Province as being due to this disease since the year 1870, the total number of which is 76,669. The maximum number of deaths occurred in 1900, when 3,484 were recorded, since which year there has been a slight reduction. The places registering the smallest number of deaths were:

Haliburton	3
Parry Sound	10
Rainy River	15
Dufferin	19
Elgin	20
Thunder Bay	25

The next most interesting disease in this group is cancer, which includes, carcinoma, sarcoma and malignant growths. In this sub-group there were 1,156 deaths, the mortality being 52.5 per 100,000 of the population, 5.34 being males and 6.22 females.

Disease of the Nervous System. Perhaps the disease which is of greatest interest to the sanitarian at the present moment is the epidemic cerebrospinal meningitis, regarding which the lay press has had so much to say lately, largely, however, of a sensational character. The deaths in Ontario from this disease number 114 against 101 in 1902. The deaths were registered in every county in the Province with the exception of the following,—Algoma, Dufferin, Haldimand, Haliburton, Parry Sound, Perth, Peterborough, Prince Edward, Renfrew, and Waterloo.

Diseases of the Digestive System. The chief disease to be considered in this group, which totalled 2,725 deaths, is cholera infantum, which carried off no less than 1,090 infants, a fact which calls for the consideration of the necessity of educating parents in the proper rearing of infants, especially as at the present day artificial feeding is perhaps more common than heretofore.

Conclusions. The following points are more particularly impressed upon me by the review of the Registrar-General's figures:—

(*a*) The necessity for placing of tuberculosis and epidemic cerebrospinal meningitis on the list of notifiable diseases.

(*b*) In order to secure more correct data *re* contagious diseases some provision should be made whereby municipalities should remunerate physicians for the notice of each case.

(*c*) The public require to be better educated as to everything that appertains to personal hygiene, from the rearing of the infant through every hour of its life until it reaches the school age, and then as to the physical and mental requirements during school life with the essentials *re* food, clothing, exercise and rest, in order to fit the child for full citizenship, and this instruction should be given under the guidance of those best able to direct the same, the Provincial Board of Health, in a manner similar to that enforced in the State of Michigan, where the special Bulletins issued by the Board are the text book of the teachers.

Laboratory Reports

By J. A. AMYOT, M.D.

Presented at Quarterly Meeting held April, 1905.

To the Provincial Board of Health of Ontario:

GENTLEMEN,—I have the honor to present you the following report on the work done in the Laboratory of the Board during the months of January, February and March:

1st. There follows a summary of the routine specimens examined.

Quarterly Summary of Routine Specimens Examined,
Jan—March (inclusive), 1905.

	Diphtheretic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total number for month.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	—	+	—	+	—	+	—				
January	11	23	26	80	42	88	13	39	5	0	38	365
February	13	21	15	53	32	86	7	27	5	0	41	300
March	10	19	23	48	35	91	8	31	11	0	47	323
	34	63	64	181	109	265	28	97	21	0	126	988
	97		245		374		125		21	126		
	342											

2nd. In addition to the routine specimens there were examined,

a. Six specimens of sewage from the disposal works at Stratford. The results tell us very little. The specimens look like chance specimens.

b. To the 31st of March extending back through the last six months, 117 specimens on as many days, of Toronto water were examined. Seven times colon bacilli were found. On five occasions colonoid bacilli, or bacilli suspiciously related to colon bacilli were found. That is: infection of the water was found to exist 12 times out of 117 specimens examined. The last occasion on which colon bacilli were found was on Feb. 10, 1905. During the previous half year 150 specimens were examined. Out of these 25 showed infection, making out of 267 examined during the year 37 infected samples. In a former report I drew attention to this periodic infection of Toronto's water and attempted by drawing attention to certain conditions existing about the Island and the intake pipe, to explain this occurrence; in brief the points were as follows:

First, the waters were not constantly infected. This would point to their probably being no leaks in the pipe under the bay.

Second, that the explanation would seen to be discoverable in varying conditions about the *intake* beyond the Island.

a. On one occasion last summer it was observed by one of us that on a certain day a direct line of darkened water leading from the Garrison Common sewer was seen to pass out in nearly a direct line to the southeast, over the position of the intake to the south of the Island.

b. In a former investigation by the Laboratory a line of sewage pollution leading 1½ miles south of the Island directly from the Eastern Gap was shown to exist by both bacterial and chemical tests.

c. The deep and the surface currents running along the front of the Island have been frequently observed to correspond to changes in the direction of the winds.

e. That there is mixing of the surface with deep water was shown on one occasion to be existent in that water at a depth of 80 ft. off the island shore was shown to have a temperature of 65° F. when the normal water of Lake Ontario rarely ever shows a temperature beyond 35°-36° F. at any time of the year.

f. Again, from a record of the direction of the windows for the first six months of these examinations that on nearly every occasion that infection was found the wind had been blowing in a direction for one or two days previously, either from the northwest, northeast or east.

g. Then Harbor Master has informed me that the currents are in or out of the two gaps according to the winds. That a difference of from 12 to 15 inches in the level of the waters of the Bay east or west has frequently occurred when the winds are strong. It is quite common with a light wind to find a difference of 4 inches. In consequence of this difference in level the currents through the gaps are frequently very swift, 2 to 3 miles per hour.

h. The greater part of the sewage of Toronto is emptied into this Bay.

i. The quantity of chlorine in Toronto water is good evidence of the influence of this sewage on the city's water, which shows on an average, 7 parts per million, whilst at Mimico, the average is 6 parts per million, and at Scarborough 6 or even 5 frequently. Out in the lake it is 4 per million.

j. The typhoid rate in Toronto is high.

k. The influence of sewage or its reduction on the typhoid rate is graphically shown in Chicago, for since the drainage canal was put in operation the typhoid rate there has fallen 2-3. The other third has been accounted for by Dr. Jordan from the fact that the sewage of 225,000 inhabitants of Chicago is still being discharged into the Bay, and this from experience at other places presumably gets to the water intake. Again, Niagara Falls, N.Y., receiving almost crude sewage from Buffalo, suffers from a very high typhoid rate. Their water shows bacterially this infection. On the Canadian side, the water is taken from the opposite side of the river, where, it is presumed, the sewage does not get, and there is very little typhoid there. The contrast is marked.

l. Liverpool and Birmingham, England, getting their water from the mountains in Wales, are now filtering, though most people would say the water is beyond question.

m. We cannot say that Toronto's water is beyond question. The ordinary citizen feels that it is not. The water man knows that it it not.

n. Now, there are two ways open to make Toronto's water safe. 1st, treat her sewage to the last degree or filter the water.

Mr. Rust has estimated that it will cost $4,000,000 to put in such a treatment system. At Belmont Park in Philadelphia filtration works to purify the river water have been put in for $2,580,000. Their capacity without preliminary filtration is 33,500,000 gals. per day. This quantity is much in excess of what would be required in Toronto, where the rate of filtration would be two to two and a half times greater. Then again, material there cost more laid down than here. The location for such a works is ideal at Scarborough heights, where there is an elevation of 385 feet above Lake Ontario. Material can be got right at hand. Can lifted directly from boats, low priced carriers. The water would then gravitate to Toronto. There would be no necessity for changing the present lay-out of the distribution pipes of the city. The pressure would be constant. With a reservoir rest could be given the pumps. The cost of pumping to the Heights would be much less than to maintain by constant pumping, the pressure now in vogue with all the friction.

Above all, we would have pure and unquestionable water, with no fear that untoward weather would pollute, as would be possible with the best and the more costly sewage disposal plant. The question of sewage disposal for Toronto would then be reduced to the simplest possible problem. The Government has refused to do the most desired work that we need in Toronto, because it objects to dredging out the great tons of solids that run into our Bay or Harbor every day. This could all be held back by sedimental basins and septic tanks. By the latter 50 per cent. of the organic matter could be removed, the remaining 50 per cent. would be considerably altered for the better and would be rendered liquid and put in such a condition that it could easily mix with the Bay and afterwards Lake water. There would be no necessity then for a big intersepting sewer. Tanks, several of them, could be placed along the water front from east to west of the city, at convenient intervals. Toronto could in this way have a perfect water supply plant and a sufficient sewage disposal plant for a less cost than it would require to treat the sewage alone to give a still doubtful water supply.

3rd. Two 2-weeks' sets of Toronto's sewage have been analyzed during the last quarter. The results are appended.

4th. The work begun last year in the study of the effects of oft repeated doses of C.O. gas have been pushed vigorously. Studies are being made at the same time of continued small dosage and also of large knockout doses, both as to the blood and tissue effects in all three. Some interesting phenomena have already been observed. A good deal of the work is almost pioneer work. It is taking much time to develop our technique, and besides continuously new problems present themselves.

5th. An inspection at the request of Dr. Hodgetts was made of a dispute over diphtheria quarantine in Aurora was made.

6th. Also at Dr. Hodgetts' request an inspection of the Ingersoll water system was made. A report is presented.

7th. After instruction from you at your last meeting with reference to the examination and standardization of the diphtheria antitoxines sold in Ontario and also of the vaccines doled out here, a trip was made to the New York State Antitoxine Laboratory at Albany, and afterwards apparatus ordered for the accomplishment of the work. There are no firms carrying such glassware on this Continent, so have had to wait until it can be made, and hope at your next meeting to be able to show you some results.

8th. During the last few days an interesting examination as to results was made with the water coming from certain household water filters. Results appended.

All of which is respectfully submitted,

John A. Amyot,
Director of Laboratory.

Report from Laboratory of Provincial Board of Health for Quarter Ending March 31st, 1905.

Counties.		Diphtheretic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Water.		Total number for month.
		Release.		Diagnosis.							Chemical.	Bacterial.	
			—		—		—		—				
Algoma	8					3	8					1	12
Brant	2			1		1							2
Bruce	3				1	1	2						4
Carleton	7	2		3	4	2	2		1			2	16
Dufferin	7				1	1	5			1		2	10
Elgin	2						1					3	4
Essex	7		4			2	4						10
Frontenac	8	4	9	6	10	11	25	3	5	1		2	76
Grey	14			1	1	2	11		1			2	18
Haldimand	9					4	4		2				10
Haliburton													
Halton	7		3	2	4	2	4						15
Hastings	14					9	13		2				24
Huron	7			1	4	2	1		4				12
Kent	10			1	2	3	13		6				25
Lambton	19			2	3	2	15		1				23
Lanark	5	2	6	1	3	1	1		2				16
Leeds and Grenville	9					2	9	2					13
Lennox and Addington	7		1	1		2	5	1	4			4	18
Lincoln	7	1	1	1	3	3	5		2	1		8	25
Middlesex	6				1	1	3					8	13
Muskoka	7	1			3	1	6		2				13
Nipissing	4		1			2	1	1	2				7
Norfolk	4				1	1	5		2				9
Northumberland and Durham	13		2	1	5	3	12						23
Ontario	15			1	2	2	9		3			1	18
Oxford	10	1	1		2	5	5	1	3			4	22
Parry Sound	13		3	1	6	1	13	3	3	1		7	40
Peel	4	1	2	1		3	1						7
Perth	7				2	2	2		3	6			15
Peterboro	6		1		4	4	6		1	1			17
Prescott and Russell	5						1	3	6			1	11
Prince Edward	12				1		1						2
Rainy River													
Renfrew	9	2	2	2	3	1	5		2				17
Simcoe	17	1	1	7	5	4	6	2	3	1		7	37
Stormont, Dundas and Glengarry	7			2	1	1	3		1	1			9
Thunder Bay	2					1						1	2
Victoria	10			1	4	3	4		1			2	15
Waterloo	9			3	6		5		2				16
Welland	5	1		3	3	3	2	1	1				14
Wellington	15	3		6	5	3	8		4				29
Wentworth	8		2	2	8	4	4		2	1	......	1	24
York	26	15	29	14	78	11	34	11	26	7	......	70	295
Totals		34	63	64	181	109	265	28	97	21	......	126	988

Analysis of Stratford Sewage Specimens.

—	No.	Free NH_3	Alb. NH_3	Ox. Cons.	Chlorine.	Nitrites & Nitrites.
Avon River	1	38.5	7.75	6.5	170	....
No. 1 Bed	2	40.0	8.00	4.9	178	....
No. 6 Bed	3	43.0	6.5	3.9	195	....
South Tank	4	11.75	6.5	4.4	145	....
Large Tank	5	43.25	10.75	4.65	195	....
Raw Sewage	6	19.50	10.00	6.80	350	....

All specimens slightly turbid and look exactly alike. No. 6 has slight sediment.

Geo. G. Nasmith.

These look like chance specimens and give us no information.

TORONTO SEWAGE SPECIMENS.

Dufferin Street.

Parts in 1,000,000.

Date, 1904.	Free NH_3.	Alb. NH_3.	Ox. consumed.	Chlorine.
December 19	15.50	14.25	10.40	4.30
" 20	13.50	6.50	7.35	42.00
" 21	16.25	7.25	8.00	35.00
" 22	17.50	6.25	8.35	40.00
" 23	13.50	6.00	14.95	48.00
" 24	19.00	6.00	....	....
" 25	22.75	5.75	....	....
" 26	15.00	4.25	5.00	46.00
" 27	7.00	3.75	6.05	20.00
" 28	17.00	5.50	7.15	42.00
" 29	17.00	5.00	8.50	28.00
" 30	18.50	4.50	5.30	37.00
" 31	21.00	5.50	3.50	39.00
1905.				
January 1	21.75	6.50	5.80	39.00
" 2	19.59	6.08	5.80	41.00
February 14	13.25	6.75	8.80	50.00
" 15	11.75	12.00	6.85	45.00
" 16	11.50	5.25	8.15	55.00
" 17	13.00	5.75	2.45	45.00
" 18	17.50	4.25	5.90	45.00
" 19	8.25	4.25	8.40	50.00
" 20	12.75	5.75	6.80	80.00
" 21	12.00	6.25	7.00	60.00
" 22	12.25	6.25	7.50	70.00
" 23	14.00	4.25	9.15	150.00
" 24	20.00	5.00	7.65	70.00
" 25	16.75	7.50	6.80	40.00
" 26	24.00	5.75	4.20	60.00
" 27	10.50	4.75	5.20	70.00
Average	15.59	6.097	6.58	46.93

Garrison Creek.

In parts per million.

Date, 1904.	Free NH_3.	Alb. NH_3.	Ox. consumed.	Chlorine.
December 19	16.50	7.00	8.20	81.00
" 20	13.75	7.00	6.70	44.00
" 21	15.50	7.75	7.55	70.00
" 22	14.75	7.75	7.60	56.00
" 23	14.50	6.75	13.65	50.00
" 24	15.00	5.25	....	....
" 25	18.50	5.00	....	....
" 26	16.00	6.00	4.20	34.00
" 27	5.00	3.75	6.00	23.00
" 28	12.50	5.25	6.05	43.00
" 29	12.75	5.75	5.90	43.00
" 30	23.00	6.00	4.30	54.00
" 31	19.00	7.25	5.55	46.00
1905.				
January 1	18.25	3.75	5.50	39.00
" 2	17.36	5.70	6.02	44.90
February 14	13.25	6.75	8.80	50.00
" 15	11.75	12.00	6.85	45.00
" 16	10.5	6.00	9.85	75.00
" 17	14.50	6.00	6.75	60.00
" 18	12.50	3.75	6.60	45.00
" 19	13.00	7.50	7.60	50.00
" 20	11.50	8.75	10.05	65.00
" 21	1.75	3.75	9.25	75.00
" 22	15.00	5.75	5.30	50.00
" 23	13.75	5.75	8.50	60.00
" 24	21.50	3.00	6.25	70.00
" 25	12.50	5.75	6.60	70.00
" 26	22.50	5.00	3.90	50.00
" 27	12.75	6.00	7.95	70.00
Average	14.44	6.06	6.60	50.44

Yonge Street.

In parts per million.

Date, 1904.	Free NH_3	Alb. NH_3	Ox. consumed.	Chlorine.
December 19	9.00	5.50	10.10	45.0
" 20	8.50	5.50	13.30	66 0
" 21	7.50	5.75	8.30	60.0
" 22	10.00	6.25	13.55	78.0
" 23	10.50	6.50	23.65	98.0
" 24	20.50	7.25	....	....
" 25	14.25	4.50	....	....
" 26	18.00	4.50	5.20	34.00
" 27	7.00	4.75	17.95	75.00
" 28	5.25	4.75	9.15	62.00
" 29	5.75	5.25	12.00	60.00
" 30	6.00	2.75	4.90	69.00
" 31	17.75	6.00	8.65	60.00
1905.				
January 1	14.25	4.25	5.15	41.00
" 2	14.06	5.17	8.54	55.20
February 14	10.05	6.25	7.85	80.00
" 15	5.75	6.75	7.60	55.00
" 16	4 50	4.00	5.95	50.00
" 17	5.00	2.50	4.55	45.00
" 18	7.00	3.50	5.90	65.00
" 19	8.75	3.00	8.90	60.00
" 20	6.25	4.00	6.00	100.00
" 21	5.50	3.00	3.05	165.00
" 22	7.25	4.25	8.15	85.00
" 23	8.25	4.25	9.60	70.00
" 24	9.75	7.75	9.75	60.00
" 25	9.25	2.50	7.80	70.00
" 26	12.00	2.50	4.25	65.00
" 27	5.00	3.75	6.70	80.00
Averages	9.74	4.71	8.15	64.0

Jarvis Street.

In parts per million.

Date, 1904.	Free NH_3	Alb. NH_3	Ox. consumed.	Chlorine.
December 19	15.50	7.00	5.70	239.00
" 20	21.50	11.25	4.10	310.00
" 21	11.75	8.25	7.35	320.00
" 22	15.25	8.00	13.70	359.00
" 23	14.00	9.25	18.20	200.00
" 24	23.00	9.25	....	....
" 25	24.25	5.75	....	....
" 26	17.00	9.00	6.20	152.00
" 27	8.50	4.25	16.30	133.00
" 28	17.25	6.50	16.80	240.00
" 29	10.50	13.75	21.95	396.00
" 30	12.75	5.75	.85	310.00
" 31	26.25	6.00	7.85	243.00
1905.				
January 1	25.00	8.00	13.30	155.00
" 2	23.39	7.39	10.75	221.30
February 14	27.25	10.00	15.35	660 00
" 15	8.25	8.75	6.60	180.00
" 16	5.00	4.00	5.00	130.00
" 17	7.50	5.25	8.55	450.00
" 18	22.75	5.75	8.90	90.00
" 19	10.00	4.20	10.35	90.00
" 20	11.50	5.75	7.65	225.00
" 21	11.75	8.00	4.25	75.00
" 22	10.75	4.75	10.65	185.00
" 23	11.75	6.00	12.15	190.00
" 24	18.25	12.00	10.25	210.00
" 25	11.50	7.00	8.90	235.00
" 26	24.50	6.25	5.45	140.09
" 27	14.00	10.75	5.90	110.00
Averages	15.88	7.54	9.03	215.4

Don, Front Street.

In parts per million.

Date. 1904.	Free NH_3.	Alb. NH_3.	Ox. consumed.	Chlorine.
December 19	117.50	118.00	69.0	1780.0
" 20	76.25	142.5	103.50	2676.0
" 21	100.00	212.5	55.00	740.0
" 22	61.15	152.5	78.40	405.0
" 23	42.00	82.5	451.25	1850.0
" 24	88.75	110.0	....	....
" 25	17.50	12.50	....	....
" 26	19.00	12.00	55.50	410.0
" 27	22.50	25.00	13.85	900.0
" 28	43.75	53.75	21.6	245.0
" 29	24.5	75.00	32.6	2875.0
" 30	27.5	80.00	41.0	4500.0
" 31	87.75	88.75	22.24	144.0
1905.				
anuary 1	12.25	16.25	7.65	790.0
" 2	51.06	64.61	39.02	823.8
February 14	38.75	41.25	55.25	1600.0
" 15	41.25	21.25	182.50	1500.0
" 16	23.75	42.00	61.00	340.0
" 17	25.00	28.75	30.00	2250.0
" 18	32.50	31.25	54.75	4880.0
" 19	8.25	5.00	23.4	700.0
" 20	13.75	22.50	76.25	2200.0
" 21	27.50	28.75	38.25	205.0
" 22	23.75	30.00	23.70	230.0
" 23	23.75	75.00	27 50	870.0
" 24	86 25	56.25	21.75	5500.0
" 25	10.00	21.25	66.50	550.0
" 26	17.5	5.50	2.00	25.0
" 27	41.25	113.50	45.00	8060.0
Averages	41.54	61.31	58.56	1615.0

Don at G. T. R.

In parts per million.

Date, 1904.	Free NH_3.	Alb. NH_3.	Ox. consumed.	Chlorine.
December 19	5.50	9.00	2.90	33.0
" 20	4.75	3.25	3.65	29.0
" 21	6.00	5.25	3.00	60.0
" 22	22.5	12.50	11.55	156.0
" 23	3.25	4.00	2.80	25.0
" 24	3.25	3.50	....	....
" 25	3.00	2.00	....	....
" 26	4.50	3.75	9.90	31.8
" 27	2.75	3.75	4.20	24.0
" 28	1.25	4.50	6.80	23.0
" 29	.75	2.50	5.90	33.0
" 30	1.25	1.75	5.40	38.0
" 31	3.50	3.75	3.80	56.0
1905.				
January 1	1.75	3.75	3.10	25.0
" 2	3.38	4.05	4.18	42.06
February 14	3.25	4.00	3.10	40.00
" 15	3.00	6.00	2.85	45.00
" 16	2.75	2.50	3.20	50.00
" 17	4.50	2.75	3.20	40.00
" 18	2.00	1.50	3.55	45.00
" 19	1.50	1.75	3.20	30.00
" 20	2.75	2.50	2.40	70.00
" 21	2.50	2.50	2.95	90.00
" 22	2.50	2.25	3.10	60.00
" 23	2.50	3.00	2.25	70.00
" 24	2.25	2.00	2.00	60.00
" 25	11.75	26.00	2.00	60.00
" 26	1.75	2.25	1.65	40.00
" 27	3.00	4.50	2.65	60.00
Averages	3.92	4.78	3.63	64.68

Rosedale Creek.

In parts per million.

Date, 1904.	Free NH_3.	Alb. NH_3.	Ox. consumed.	Chlorine.
December 19	16.50	8.50	10.40	42.0
" 20	13.75	4.00	6.85	42.0
" 21	11.75	4.50	5.40	46.0
" 22	9.25	4.50	4.70	28.0
" 23	9.00	5.25	8.20	70.0
" 24	15.50	6.50	....	....
" 25	17.00	5.00	....	....
" 26	17.00	5.00	6.30	30.0
" 27	5.00	10.00	10.10	24.0
" 28	5.00	2.75	5.00	28.0
" 29	5 25	3.75	10.35	32.0
" 30	6.25	3.25	4.70	29.0
" 31	10.25	4.50	5.15	34.0
1905.				
January 1	9.75	6.50	1.45	28.0
" 2	10.31	5.41	4.60	33.0
February 14	23.75	6.25	23.50	74.0
" 15	19.00	4.25	14.95	150.0
" 16	16.25	7.25	8.50	240.0
" 17	15 75	5.25	6.55	170.0
" 18	11.25	4.25	6.65	80.0
" 19	12.00	3.75	7.90	85.0
" 20	13.00	3.25	14.30	125.0
" 21	13.75	5.75	7.35	65.0
" 22	15.00	5.50	8.90	80.0
" 23	12.75	3.75	8.20	80.0
" 24	17.25	8.25	5.60	75.0
" 25	16.50	4.75	5.05	195.0
" 26	11.50	5.50	5.15	170.0
" 27	12.00	6.25	5.75	85.0
Averages	12.8	5.27	7.12	58.6

Report on waters collected by self from certain filters at the Parliament Buildings, Toronto, on April 18th, 1905. Analyses were begun on same day.

Laboratory numbers.	Where collected from.	Number of bacteria per 1 c.c.	Strepto-cocci.	Stephylo-cocci.	Colen Bacilli.	Colenoid Bacilli.	Chlorine in parts per million.
1043	Press gallery	2,100	none.	none.	none.	Present.	7
1044	Gov't lobby	6	none.	none.	none.	none.	7
1045	Opp'it'n lobby	91,000	none.	none.	none.	Present.	7

Toronto city water shows an average of 125-150 bacteria per cubic centimeter of water. Two of the above show suspiciously intestinal bacteria.

Report *re* Diphtheria in the Village of Aurora.

BY JOHN A. AMYOT.

To the Chairman and Members of the Provincial Board of Health of Ontario.

GENTLEMEN,—On March 3rd, 1905, at the request of the Local Board of Health, I was sent by Dr. Hodgetts to visit the Town of Aurora to gather data as to a complication arising there over the intrepretation of the regulations governing quarantine in diphtheria and scarlet fever.

The dispute arose over a case of diphtheria in the practice of Dr. Richardson. This case had been reported to Mr. Lundy, Secretary of the Local Board of Health, the usual card was put up and the regular quarantine established. The patient made a rapid recovery, so that at the end of seven days Dr. Richardson was satisfied there was no lesion existing in the throat and sent in the old time certificate stating that the patient "had recovered" and was no longer "infective." Mr. Lundy then raised quarantine. Dr. Stevenson, M.H.O. of the town, protested, but nothing was done, so he resigned. When I saw him, Mr. Lundy admitted that he had done wrong, and said that he had done it thinking Dr. Richardson's certificate of recovery was sufficient. He was now willing to re-establish quarantine, if the swab that I would take back with me still showed bacilli of diphtheria present. This swab was taken by me in the presence of Dr. Richardson; it proved positive and was so reported to both Dr. Richardson and Mr. Lundy.

I met all the members of the local Board of Health and after pointing out the law to them they assured me that the Regulations would in the future be strictly adhered to, and I feel confident they meant what they said.

All of which is respectfully submitted.

Signed, JOHN A. AMYOT,
Bacteriologist.

Medical Inspector's Reports.

By R. W. BELL, M.D.

PRESENTED AT APRIL MEETING OF THE BOARD.

Smallpox, Sudbury District.

In the early part of February I visited again the Sudbury District where I had seen a case of Smallpox in the previous November, in the adjoining Township of Hanmer. I fear the District has not been free from the disease for several years, as there are a large number of settlers in the outlying townships who do not fear the trouble, in fact rather court it, as there is a delusion that they must have it some time and the sooner the better, so long as it is of a mild type. Under these conditions it is concealed from the Authorities, and our efforts to stamp it out are greatly interfered with. The majority of these cases are well isolated and confined, for the time being to one family, but as the houses, clothing, etc., are not properly disinfected after the patients recover, later on we find a fresh outbreak in some one who has visited the place. It may be necessary to punish some of those evading the law by concealing the outbreak, but I fear such will result in greater efforts to conceal any development, when we consider the views of these people regarding it.

At the time of my visit I was informed that there had recently been sixteen cases in the camps of two lumber concerns in the Townships of Hutton and Norman, some of whom had recovered and the remainder were doing well, every precaution necessary being taken by Dr. Struthers the camp Physician. Three weeks later these cases were all reported well, and no further cases developed.

At this same period I visited a valley in the Township of Broder, inhabited by eight or ten French families, and I found fourteen cases in five families. These were all quarantined, and I vaccinated all persons who could not show good marks of recent vaccination. Some of these families had to be supplied with provisions, as they live from hand to mouth, selling an occasional load of wood in Sudbury or Copper Cliff. I again visited this locality on March 1st, and took all necessary steps so far as possible, to disinfect the houses and clear up the disease, no fresh cases having broken out in the neighbourhood.

At the request of the local physicians and the M. H. O. I visited the Town of Copper Cliff on Feb. 7th, and there diagnosed a case of smallpox in a large boarding house. There were at the time three other cases quarantined in town. I urged that their Isolation Hospital be at once opened, all the cases be removed to it, and the boarding house be quarantined. This was done, but two more cases developed in the boarding house within two or three days. In the early part of March I learned there had been no further outbreak and that the cases in hospital were nearly well. At this latter period there was one case in Sudbury, almost recovered under the supervision of the M. H. O.

On Mar. 2nd I visited the Hospital of the Railway Construction Co. (Foley Bros.) a few miles south of Wahnapitæ, and found everything in good order, an isolated case of smallpox having been discharged the previous day completely recovered. Every precaution had been taken by Dr. Ewing, the contractor's Physician, and his assistant Dr. Ainsley, to prevent the spread of the disease, and it had been confined to one case, although hundreds of men were working along the line.

On March 4th, I visited the Railway Construction Camps of the Temiskaming and Northern Ontario Railway at the end of the track laying, nearly thirty miles beyond New Liskeard. There I found a recent case of smallpox just in the previous day, and that one had been discharged two days before. Both these cases were teamsters who were freighting up the line for fifty miles beyond, and who had been in there for months. No other cases existed where they were working, so I fear the infection has been taken in, in bedding or clothing and we may yet hear more of it. These cases were well cared for, under Drs. McLaren and Ford, the contractors' physicians. I ordered all employees in this camp to be vaccinated, and also all incoming teamsters, and as many as possible along the line.

In New Liskeard there was also one case at this time, but convalescent. This case was said to have come from the neighbourhood of the Indian Reserve at North Temiskaming. I found on investigating that the Quebec authorities had recently visited that locality, and had taken all necessary precautions to prevent any spread of the disease.

These cases, together with the ones previously reported in Tp. of Lorraine, are the only cases I have had to deal with in the Unorganized Territory during the past winter. All were comparatively mild and none fatal.

The lumber camps, except the two north of Sudbury have been almost free from Smallpox, and such being the case the enforcement of vaccination prior to the engagement of the men, has become almost a dead letter. The majority of the employees were vaccinated a couple of years ago, during the severe epidemic which overran Northern Ontario at that time, and the beneficial effect is now observable, but as time runs on and more unvaccinated men get into the camps there will be a return of it, and another outbreak. I have tried to impress this upon the lumbermen and urged them to enforce vaccination, but they object in many cases, owing to scarcity of men, who positively refuse to submit and will not hire, or will leave the camp rather than be vaccinated. Unless there is unity of action amongst the employers it will be impossible to enforce this regulation. Very few of those who have been vaccinated have any certificate to show when it was done, and those who do get them carry them about in such a way that they are worn out in a few months. These certificates should be on a stiff card or a piece of parchment so as to be lasting.

At Sturgeon Falls I found five firms which had taken united action in 1902, and issued the following notice printed on large conspicuous cards, but to-day there is laxity in enforcing the agreement.

NOTICE.

To all Workers in Lumber Woods.

Take notice that complying with the Regulations of the Provincial Board of Health, the undersigned employers of labor in lumber woods will not engage any man to work in our lumber camps unless he can produce a certificate from a duly qualified medical practitioner that he has had Smallpox, has been recently vaccinated or is immune to vaccination. This certificate to be deposited with the firm hiring, and held until the man leaves employ, when it will be handed back to him.

THE STURGEON FALLS PULP CO., LIMITED,
THE NIPISSING LUMBER CO., LIMITED.
J. R. BOOTH,
GEORGE GORDON & CO.,
COCKBURN & SONS.

Sturgeon Falls, 26th July, 1902.

I would strongly suggest that the lumbermen and other employers of labor be requested to adopt similar agreements and have them not only posted up in their offices, but also in the various places where they are in the habit of hiring men, as in hotels and other public places in Ottawa, Hull, etc.

Isolated cases of Smallpox have been reported from many organized municipalities all over the Province, but in all cases prompt measures appear to have been taken and successfully to stamp it out, by the local health Authorities.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

Toronto, March 17th, 1905.

Smallpox in Wallaceburg and Hanover.

On March 27th ult., I visited Wallaceburg, County of Kent, to investigate an outbreak of Smallpox, and there learned that the disease had been in one or two families in a somewhat light form for several weeks without being recognized. Ultimately it was diagnosed in the Broadbent family, in Mrs. Broadbent a deaf mute living near the railway station. The house was placarded and quarantined, and all outsiders known to have been exposed were said to have been vaccinated, quarantined and their houses disinfected.

At the time of my visit it existed in two other houses in the Town, the head of the family in each case being well advanced with the disease, but none confined to bed. Their wives had recently recovered from attacks. There were children in these three houses, none of whom had been vaccinated, a most serious oversight. At the Broadbent house the Smallpox and quarantine placards had been deliberately removed by the health authorities from the front of the house and placed on the back, in an angle with no entrance and where not visible from the street. This was done because the business men protested that travellers coming from the railway station would seen them and avoid the town. A watchman was placed on the opposite side of the street to keep the patient from leaving the house, which she was inclined to do, and to warn away anyone who attempted to enter the house. A watchman who was supposed to be in charge of the other two houses three or four blocks away was spending his time in company with the one at this house.

One of the other houses only had a quarantine card on it, and no Smallpox card. The patient in this house was said to have been quarantined as a suspect ten days before, although the rash was then out on him, and now it is in pustular stage and some drying up. I ordered the placards to be properly placed, and the children in the infected families to be at once vaccinated, and urged the removal of all the patients to an isolated building. The M. H. O. and Chairman of the Board of Health promised to attend to the above immediately and to deal vigorously with any further cases should they occur.

On March 31st, I visited the Town of Hanover, County of Grey, to see a suspected case of Smallpox, but which had been passing for chickenpox. I found the patient, a baker, living over his shop or salesroom, in the heart of the town with his wife and two children about him, and other employees working down stairs and attending to customers in the shop.

The patient was taken ill on the 20th inst. with supposed Lagrippe, but on the 23rd the rash appeared and he was questioned as to exposure, and said he had visited relatives two weeks previously near Williamsford, twenty-five miles distant where there was chickenpox, and no further medical attendance was solicited except by messenger to the doctor's office. At the time of my visit, although the patient was not in bed, there was developed as well marked a case of Smallpox in the pustular stage—ninth day of the rash—as one could wish to see.

The town not having any M. H. O. I at once reported the position of affairs to Dr. Mearns, Mayor, and in a few minutes the shop was closed up and the house placarded. Meetings of the Town Council to appoint a M. H. O., and the Board of Health to arrange for isolating this and other cases which may develop, were immediately called, but it is unfortunate that the case was not sooner diagnosed as a large number of people have been more or less exposed by visiting the shop and coming in contact with those who were waiting on the patient.

I hastened on to Williamsford the supposed point of infection, and there found the family where the supposed chickenpox had existed, living three miles out and well isolated from all neighbours. This family realizing the necessity of checking the spread even of chickenpox, had isolated the patient when ill, prevented the visits of neighbours, and on recovery had disinfected thoroughly all exposed clothing and fumigated the whole house with sulphur, with the result that there had been no further development of what, I believe, to have been a case of Smallpox, although I could not trace it any further. No doctor had been in attendance on this case, and what had been done to prevent the spread of the disease had been on their own initiative. It is rare to find such sanitary intelligence and precautions in our rural districts except under the guidance of a physician, but with the sanitary teaching in our schools the future should show a marked improvement, and the work of the health authorities be much lightened.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

April 3rd, 1905.

Port Arthur Water Works.

While in Port Arthur last month as requested by your Secretary, I spent some little time in looking over the waterworks system which is being installed and which is rapidly nearing completion, so far as the original contract is concerned. The greater portion of the town is situated on high ground, which rises quickly from the bay, reaching a height of over 80 feet at about three blocks from it, at Court Street. There are no wells, and the town supply of water in the past has been furnished by water carriers in barrels from the bay. About two miles northeast of the town, Current river enters the bay, and as the flow is very rapid for the last few hundred yards, it runs out in a southeasterly direction for a considerable distance before mingling thoroughly with the lake water. The waterworks system has been planned with the idea of securing a supply of water from either Current river or the lake, or both. A power house with pumps, one of 1,000 gallons and two of 600 gallons each per minute is situated at the mouth of the river. A flume or intake pipe extends up the northerly side of the river about 500 yards, and as the fall in this distance is 81 feet, a good supply of water can be furnished by gravitation to a similar height in town or to the region of Court street. An intake pipe has been extended out into the bay in an easterly direction about 1,500 feet, and is protected from contamination from the town side by the flow of Current river. From this pipe the pumps will furnish a supply of lake water for the upper level of the town through a 200,000 gallon tank there situated. By opening a check valve, the lower level may also be supplied with lake water, and by use of the pumps the pressure for fire purposes, etc., may be increased anywhere. The evident intention, however, is to use the Current river water for the lower level, and the lake water for the upper, as a considerable saving will be effected in the cost of pumping.

The first service pipes were put in last October, supplying the Current river water, and all called for by the original contract will be completed in about two months, but many extensions will require to be made immediately, as services are being continually asked for. The Current river water is of a reddish yellow color from vegetable matter, and has a peculiar taste (swampy), but from analysis is said to be quite fit for domestic use. There are no habitations along the river to contaminate it. On 14th. February I saw lake water taken from taps in the lower section of the town, as connection with the lake pipe had been made and pumping begun. I think in the meantime, that the lake water from the vicinity of the intake pipe is preferable to the Current river; but should the vicinity of Bear Point be selected for the terminus of the Lake Superior branch of the Grand Trunk Pacific Railway, then this source of supply will certainly become polluted from the docks and vessels in that locality. Since last October water from Current river has been obtainable by the water carriers from a stand pipe at the Fire Hall at the rate of 2½c. per barrel, but still many frequent the bay for it, and at the time of my visit, I saw it being taken from holes in the ice, at a distance of about 200 yards from shore, a short distance from the Northern Hotel, and certainly in close proximity to the outlet of the town sewer. I was told that potato peelings and other garbage had been dipped from these holes. This I can readily believe, as the outlet is not more than two blocks south. An old system of sewers along several streets has been extended, and discharges through the one mentioned, originally 700 feet out, but now only about 200, owing to the filling in at that point. A separate sewer for surface water, discharges further north and runs out about 540 feet.

Water for domestic purposes being taken from between these two sewers, not very far apart, I think readily accounts for the numerous cases of typhoid fever prevailing in the town during the past year.

Some of the upper streets of the town until last summer had house sewage discharging into open street drains, causing vile smells in damp weather and after rain.

Owing to some friction between the Municipal Council and the Board of Health, as also the departure of the M. H. O., from town, the Board of Health was rather disorganized, but during my visit Dr. Laurie was appointed M. H. O., and I urged him as also individual members of the Board of Health, to put a stop to the supply of water from the bay in front of the town.

With a constantly increasing number of domestic water services being put in, and the bulk of the water used being from the town supply, there should be a corresponding decrease in the number of typhoid cases. This, I verily believe, in future years will prove to be the case.

In closing this report, I must express thanks for courtesies extended to me, by Acting Mayor King, Town Clerk McTeigue, Mr. Power, Resident Engineer; also, Messrs. Ray, Emmerson, Dawson and Swizel, all of whom vied with each other in affording me every facility in acquiring information in connection with the sanitary condition of the town.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector.
Provincial Board of Health.

March 20th, 1905.

Typhoid Fever at Fort William.

Owing to the prevalence of typhoid fever at Fort William during 1904, it was deemed expedient by your Secretary that I should investigate the matter, and try to find the cause. I, therefore, on Feb. 13th last, visited that town and at once interviewed Dr. Birdsall, M. H. O., who kindly drove me over the town to the sewage pumping station, source of ice supply, the water works power house, etc. He had no record of the number of cases of typhoid in town last year, as the physicians, with one exception, do not report them. Later, Drs. Hamilton and Stewart, however, assured me there had been over two hundred cases, and that over one hundred of them had been in the hospital.

The town is situated on a flat to the north of the Kaministiqua river, and not more than ten or eleven feet above it, rendering sewerage somewhat difficult. The river is slow and sluggish with a current of about three miles per hour. The sewage of the town is emptied into the river by four sewers, three by gravitation and one by pumping. The latter relieves the centre portion of the town, an eight inch pipe running on Simpson street from Victoria to Finlayson street, and receiving eight inch connections from several streets to the west. Down Finlayson street it enlarges to ten inches for one block to the pump house and there discharges into a sixteen foot well. This sewer is too small for both domestic and surface water, and as a result, after heavy rains, many cellars are flooded.

From the well the sewage is raised by pumping and discharged into an 8 inch pipe for about 400 yards, and then enlarges into 10 inch for 160 feet to the river. The fall from the pump house is only four or five inches to the river and then plunges down seven or eight feet. The pump will not raise any solid material, and this has to be frequently removed by buckets.

Another sewer on Victoria avenue is 18 inch tile for three or four blocks, and empties through a 2 foot, square cedar outlet. Two blocks further up a 2 foot square box sewer empties, said to be the most satisfactory working sewer in town, and a short distance further up still another one.

At West Fort, two miles up the river, are two sewers, one old town one, and the other from or near the old Neebing Hotel, and still in use by the Queen's Hotel, gaol, and several private houses.

The town's water supply is taken from the river by two intake pipes, well out in the stream, at a depth of 17 to 22 feet, about 400 or 500 yards below the last mentioned sewer.

At West Fort are the Canadian Northern Railway docks, and in the season of navigation there are always five or six large boats at them, dumping their garbage into the river, besides churning up mud as they pass up and down the river.

I was informed that samples of water from near the intake, also from distal taps, were sent last July, also late in the fall for analysis, and were reported as containing bacilli, and were suspicious.

The C. P. R. has its own water system, and the intake pipe is only about 100 feet below the outlet of the town's pump sewer. Here water for the shops and engines is obtained, but in the shops are taps connected with the town system for drinking purposes.

The M. H. O. says the lighthouse keeper has connection with the C. P. R system and has typhoid in his house. He also says the majority of cases of typhoid came from this neighbourhood, and he thinks the C. P. R. water is being used by some other people. A sample of water from near this supply was examined, and reported suspicious, but no typhoid germs.

I visited the source of the ice supply. and found it being cut in the river, between the mouth and the lower sewer, and stored by the C. P. R. and also for town use, but some for the latter is cut near Mission river above the town, but below the intake and two upper sewers, just a difference of being contaminated by two sewers instead of six.

The Engineer at the water works pumping station reported several recent cases of typhoid fever in a house close by, with closets emptying into an open drain, which discharges into the river a few yards above the pumping station. At the present time these discharges are frozen up, but I urged the M. H. O. to see that this drain is diverted somewhere else, before a thaw sets in, also to get a meeting of the Board of Health and arrange for a safer ice supply, and investigate whether water from the C. P. R. system is being used for domestic purposes, and if so have it stopped. I am sure a pure ice supply could be obtained from the lake by going a few hundred yards further out and clear of the current of the river.

From this description of the source of water supply, contaminated as it must be by the sewage, there can be no doubt as to the source of typhoid. Some steps should be taken to stop the use of the Kaministiqua water so long as it is polluted by the sewage. I do not think the water below West Fort will ever be safe for domestic use, and such being the case an extension of the present system beyond West Fort to secure a pure water becomes a necessity or better go to Loch Lomond on Mt. McKay. This will involve considerable expense, but distributed over a number of years it is nothing compared to the loss of valuable lives, which has already taken place, and which is sure to continue if an almost immediate change is not made.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector.
Provincial Board of Health.

Toronto, March 22nd, 1905.

Reports of Committees.

Report No. 1 of Committee on Sewage and Water—East, *Re* Port Hope.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—To your Committee has been referred a letter from Mr. J. W. Saunders, Secretary of the local Board of Health of Port Hope, stating that "Mr. Frederick Outram of Port Hope 'had asked him' to write for permission from the Provincial Board of Health to lay a six inch sewer from his three-storey brick building, situated on the southwest corner of Walton and Mill streets to enter the Ganaraska river, the length of the sewer to be about twenty feet."

We have also a plan of the topography of the environs of the proposed sewer.

The municipality of Port Hope has heretofore submitted to your Board plans for certain sewers to discharge into the Ganaraska river and has obtained the approval of them by your Board. One of these, the 10-in. Walton street sewer, is over 4,000 ft. long and empties into the river, about half a block above the proposed point of debouchment of the short 6-in. drain now contemplated for this building; and the environment of the latter does not show any difficulty, the yards of the Outram property adjoining it above and a cribwork in front of a blacksmith shop below.

Nevertheless, your Committee does not see how the Provincial Board of Health can "grant permission" to any individual, citizen or citizens of a municipality to construct or modify a sewer, unless upon a plan submitted as its plan by the Council of such municipality, as provided by Section 30, Sub-Section 2 of the "Public Health Act" of Ontario.

Even though the letter is written on the official paper of the Mayor's office, and though Mr. J. W. Saunders happens to be the Town Clerk, it is simply a statement that Mr. Frederic Outram has asked for the permission above stated through Mr. J. W. Saunders, Secretary of the local Board of Health.

All of which is respectfully submitted.

WM. OLDRIGHT
WM. OLDRIGHT.

Toronto, April 27th, 1905.

Smallpox.

A clinical description with twenty illustrations.

BY CHAS. A. HODGETTS, M.D., SECRETARY.

The oft repeated occurrence of this disease in different and widely separated municipalities of the Province during the past few years and the failure on the part of many medical men to arrive at a correct diagnose, are in themselves sufficient excuse for again bringing before the notice of the medical profession and the local health authorities, some few facts regarding smallpox.

Before discussing the question from a medical standpoint, it may not be out of place to refer to some of the popular and common errors which are and have been advanced by "knowing ones" regarding this disease, the advocacy of which untruths has done much to prevent the authorities adopting those preventative measures which are essential to the prevention of epidemics and unnecessary outlay of money by local Boards of Health.

Perhaps the most common of false ideas regarding the disease is that which finds expression in the statements "it cannot be smallpox because no one is really sick, and those who have it are at work," or "they are ill for only a day or two."

This popular misconception of the disease no doubt is due to the following facts: First, in former epidemics, the type of the disease was severe, patients suffering severely from the onset, which was generally sudden, then during the few days immediately preceding the appearance of the rash, there is headache, pains in the back and limbs with accompanying nausea and vomiting, often incapacitating them from all work.

Second. With the abrupt cessation of these symptoms, the rash began to show itself in a pronounced manner upon the exposed parts, as face, neck, hands and wrists, whereas the present form of the disease in many cases presents but few pocks or pustules, and often their presence gives but little inconvenience even when numerous.

Third. The only sickness complained of is that noticed before the onset of the rash, the secondary symptoms being either very slight or entirely absent,—this being often characteristic of cases when scores or hundreds of small pustules are present.

Fourth. The frequent aborting of the disease at the visicular stage,—as seen more particularly on the face, either the absence of the secondary fever or the slight character of the same—permitting of the patients often following their usual occupations throughout the whole progress of the disease, which frequently does not exceed a fortnight.

The other common errors are based largely upon the foregoing clinical facts and have led to the disease being called chicken pox, Cuban itch, Phillipine rash, elephants' itch, both by the laity and often by medical men, though, perhaps, the most common of professional mistakes has been to call it impetigo, contagiosa. Some few have thought it to be a new and as yet unnamed skin disease.

The experience of the past five years may be summed up briefly as follows:

Climate and season.—The disease has continued from year to year, with a maximum number of cases in January, and a minumum in the summer months. The type presented no variation in the cold of winter as compared to those happening in the heat of summer.

Contagiousness.—It would appear that the virulence of the contagium is in direct relationship to the severity of the attack. During the early stages preceding pustulation, the infection is not as great as subsequently, and the mere entering a room or house wherein is a mild case during the pustular stage, is not always followed by an attack. Often persons live for weeks in the same house with a mild case before they develop it. I have not known of a case due to aerial convection; indeed, on this point I am somewhat sceptical.

Incubation.—The usual period of twelve full days from the date of one receiving the specific infection of smallpox is, as a rule, the correct one; but the exceptions have been so numerous during the past five years, where fifteen, sixteen and eighteen days have elapsed, that for mild cases the period may safely be extended. By reason of the prolonged incubation, the period of quarantine has been extended to eighteen days, and in some of the neighboring States three weeks is the statutory period.

Initial symptoms.—While in many cases the onset, although slight in character, is often sudden, yet many patients have suffered so little discomfort, that it has been hard for them to fix any time for the onset. Mild and and insidious, indeed, have been the prodromata, from a passing malaise to headache, and backache, accompanied by nausea and vomiting; children and adults alike have had the same experience, and the latter have often followed their usual occupation throughout the whole progress of the disease. Many have described this group of symptoms as simulating la grippe more than anything else. The temperature has averaged from 100 F. to 102 F., while the instances have been as many below the minimum as above the maximum quoted.

The fever continues, as a rule, for twenty-four hours to seventy-two hours, although it frequently passes unnoticed by the patient; and often is noticed for from 1 to 12 hours; the temperature drops to normal or subnormal with the appearance of the eruption, and thus ends for many their sickness, and the usual occupation is resumed. Because the onset is severe it does not follow that the attack will be severe. nor does it hold true that the mild onset will be followed by a slight attack.

The Eruption.—This appears from a few hours to seventy-two hours after the onset, and consists, in the first instance, of minute red macules that disappear on pressure. They are not hard to the touch nor perceptibly raised above the surface. The distribution conforms very much to that of the more severe type of the disease, being more marked upon the face and extremities than on the trunk. Often within a few hours the maculæ become papules, when the shotty feel is first noticeable. This is frequently the first stage noticeable in mild cases, and by this time some of them may show distinct signs of beginning vesiculation. Thus it is stated by the patient that they began as vesicles, whereas the correct way to state it would be, the eruption was first noticed when vesiculation began. This is a fruitful source of error in diagnosis, and leads the practitioner to call the attack one of chickenpox.

The rash may appear in one crop, but more frequently, even in very mild cases, from one to three days may elapse before it has fully come out.

During vesiculation, which continues for about three days, rarely five, as seen in previous outbreaks, the vesicles increase in size until many of them become as large as a pea, pearly in appearance, and either filled or partially filled with serum. The more typical will be found to be multilocular and different to the others; will not collapse on being transfixed by a needle. Some, but not all, of the vesicles will present umbilication.

The change to a pustule may begin as early as the fourth day, and usually, in most cases, is markedly noticeable on the fifth day. The rash on the face, sometimes shrinking and drying up into thin crusts, is shed from the face and neck often as early as the tenth day. Not so, however, is the course of the lesions on the other portions of the body and the extremities. It is here prolonged, and the pustules present a more typical appearance, and on the sixth to the eighth day of the eruption there will be found a circular pustule presenting a dome-shaped appearance, and surrounded by a marked areola. These pustules shrivel, and subsequently rupture or are broken, and the contents form a dry crust, or they become inspissated, presenting a brownish appearance. Particularly is this the case in the feet and hands, where the epidermis is thickened. The stage of incrustation continues for a longer period in the latter case than where simply thin crusts form. In the majority of cases there is no dermatitis, and if present, is but slight. Intumescence, if present, is not only slight in degree but is evanescent in character, and lasts for two or three days.

The average duration of this atypical form of smallpox is slightly under twenty-one days. Difficulties of Diagnosis. The chief difficulties met with have been as follows: 1. The frequently mild form of the onset. 2. The abortive character of the eruption, as observed chiefly on the exposed parts. 3. The entire absence of constitutional depression after the appearance of the rash, thus permitting of many persons resuming their usual calling. 4. The absence of secondary fever, even in more markedly typical cases. 5. The extreme mildness of the infection, as shown in many instances. 6. The brevity of the period of incubation as compared with former outbreaks. These, and possibly a few others of a minor character, have thrown many a physician off his guard, and led in the past to rather widespread outbreaks in some portions of the Province.

Of the foregoing, the abortive character of the eruption is the greatest source of diagnostic mistakes, for it is found that the eruption, once out, does not pass through the successive stages even in an imperfect manner, but it pursues an abortive course; given a case with a definite number of maculæ, there will be found to be an aborting of numbers of these, the remainder developing into papules, of which in turn, a number will also abort before becoming even slightly pustular. It will be further found that the papules have developed into solid conical elevations, crowned by small vesicles containing sero-purulent or sero-sanguino-purulent fluid, which vesicles desiccate early, leaving the solid portion which remains for some time as a warty-like excrescence of the skin. This is most frequently noticed on the face, but disappears without leaving any permanent disfiguration.

The size of the pustules or the aborted vesicles may be particularly noted. Usually circular in outline and of the size of a split pea, yet in many instances it is found that the greater number are smaller in size, some not larger than a good-sized pin-head. The apex of many will present a dark appearance similar to an acne, though without any marked dermatitis or intumescence. In such cases some few typical pustules will be found, possibly, on the abdomen or extremities or along the hair line. Again, early rupture of the vesicles or pustules produces, where such has occurred, an irregular outline, somewhat simulating chicken-pox.

Differential Diagnosis.—The affections with which smallpox of the present type has been, and unfortunately still is, most frequently con-founded, are chicken-pox, impetigo contagiosa, pustular syphiloderm, urticaria papulosa and acne. Of these chicken-pox is the most common, chiefly owing to the fact that the premonitory symptoms have been so mild that the patient has misrepresented them to the physician; and coupled with these mis-statements there is found on looking at the exposed parts only a few, often only one or two, abortive vesicles or pustules. The examination is not pushed any further. Both parties concerned are satisfied; the patient particularly so from the knowledge of the fact that isolation will not be necessary, although he may be well aware that had the physician stripped him, an altogether different condition of affairs would have been found on the "hidden parts." The blame is in most instances to be laid at the door of the patient rather than at that of the medical attendant for the mistake, for had the one been honest, the other would have been more painstaking in his examination. In smallpox, believe nothing you hear, doubt much you see on first appearances, but carefully note all that the surface of the body has to reveal to both touch and sight.

The chief characteristics which distinguish chicken-pox from the present mild form of smallpox are: 1. It is a disease chiefly confined to childhood, being only occasionally seen in adults. 2. It rapidly runs its course in a week, passing through the stages of pimple, vesicle and scab, often within twenty-four hours after the first appearance of the papular rose spot the vesicle develops. 3. The premonitory symptoms are but slightly marked; indeed, are frequently wanting altogether. 4. The temperature accompanies or follows the appearance of the rash. 5. The vesicles of chicken-pox are ovoid or irregular in appearance, and attain their maximum development much quicker than do those of smallpox. 6. The eruption, as a rule, appears first on the portions of the body covered by clothing. 7. After the crusts fall off they leave a red instead of a pigmented spot. 8. Does not appear on palms of hands or soles of feet.

With these differential symptoms, it must be stated that many cases of smallpox of the present type occur, making it extremely difficult to correctly place them.* "It may, however, be stated in a general way, that a mildly febrile eruption, appearing without prodromal symptoms, being distinctly vesicular from the beginning, and commencing to desiccate on the second or third day, should be regarded as chicken-pox; and on the other hand, an acute exanthem, preceded by an initial stage of forty-eight hours, in which the temperature was distinctly elevated, beginning as papules and ending in vesicles and vesico-pustules, even though the period of evolution be short, should be regarded as smallpox."

Impetigo Contagiosa.—The chief points in the differential diagnosis of this disease are: 1. It is a skin affection, rarely accompanied at any stage of its progress by an elevation of temperature. 2. There is no initial stage. 3. It does not begin as a papule, but as a vesicle, or vesico-pustule, or growth of the same upon an apparently normal skin. 4. It appears chiefly on the face, head and hands—the exposed parts. 5. It is usually unsymmetrical and superficial, and spreads from the periphery, often attaining the size of a ten-cent piece. 6. The crusts are of differing degrees of thickness, are varied in color from straw to a brownish hue. They are friable, crumbling very easily. On removal, the base is covered with pus, which on healing leaves no scar. 7. Fresh inoculation may occur in the same individual, the infecting material being generally carried by the finger nails to any part of the skin.

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* Com. W. Welch, M.D., Philadelphia Medical Journal, Nov. 18th, 1889.

Pustular Syphiloderm.—Although few mistakes have arisen from the diagnosis of cases of smallpox for pustular syphiloderm, yet there is a greater resemblance between these two diseases than is generally supposed. This stage of syphilis is ushered in by fever and accompanying pains and aches, very similar to smallpox. There then follows the papular eruption, which subsequently ends in the pustule. The chief distinguishing points are: 1. The absence of the shotty feel of papules. 2. The formation of small vessels at summit of the papules. 3. The large indurated base of the vesicles. 4. The appearance of the rash in successive crops. 5. Umbilication is absent. 6. The tendency of some of the lesions to ulcerate. 7. Examination reveals other symptoms of syphilis. 8. A history of the initial syhpilitic lesion is confirmatory.

Urticaria Papulosa.—In this disease the papules are small, the size generally of a split pea; in color a dull white. They attain their full size in one or two hours. The initial symptoms are absent.

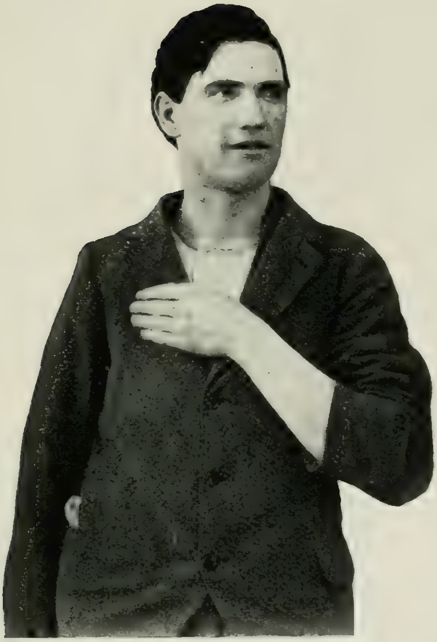
Acne.—This skin affection occurs chiefly at puberty, and the chief points in the diagnosis are: 1. The absence of initial symptoms. 2. The pustules are acuminated with a black central dot or comedo. Base is indurated. 3. The face, shoulders and back are chiefly affected. 4. The rash will be found in all stages in the different portions of the body. 5. The chief diagnostic difficulty is found in the rash as it affects the face, as in these mild cases it often simulates acne. An examination of the whole body will assist in clearing up the diagnosis. There is no necessity to refer to the rashes which happen in the initial stage, for in this type of smallpox they seldom occur.

History of the Disease.

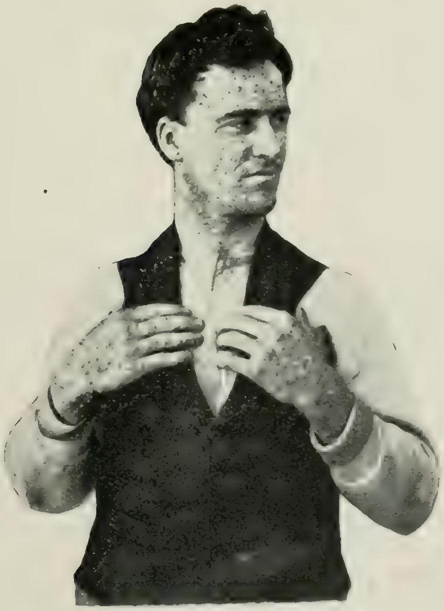
The first outbreak of the disease was that which occurred in Essex County in the fall of 1899, when 272 cases were reported, with one death, a mortality of 0.39 per cent., the disease in this instance having spread from the adjoining State of Michigan. In the following years the disease became more widespread, the infection in many instances being traceable to the United States. Although it became so general in this Province, yet the type did not on the whole become more severe, as shown by the mortality, although there were individual instances where the character of the symptoms approached more nearly to the text-book type.

In the winter of 1900-1 it appeared in the lumber shanties of New Ontario, having been brought there by shantymen from Michigan, one man, to my personal knowledge, being the cause of its breaking out in at least four different points, scores of miles apart. In these distant parts the disease made rapid progress before its presence became known, the hardy shantymen becoming a ready nidus for the disease from the fact that nearly all were unvaccinated, and living as they do huddled together in the shanties, one case soon spread it to the rest of the camp, and, as a matter of fact, camp after camp was attacked without one case being ill enough to call in the services of a physician. These men had suffered from "la grippe" when it was epidemic, and here was a disease in most instances not so severe; true, a few "pimples" appeared afterward, but on the whole they felt better and work was resumed—the pimples were of no account. And it was not until February, 1891, that a case reached the notice of physician, who recognized the true character of it, that the provincial authorities were apprised of the fact.

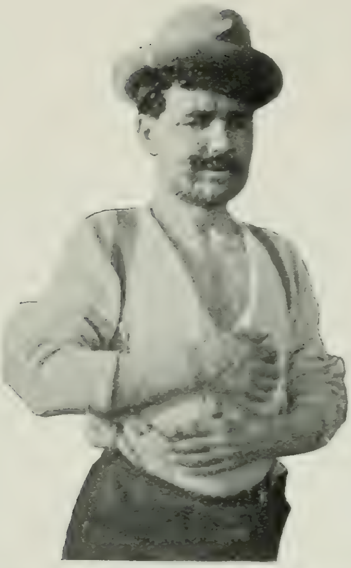
From New Ontario the disease spread to the older portions of the Proince, and has remained with us ever since, although it was virtually wiped out in the place where it first began, for the few cases occurring during the



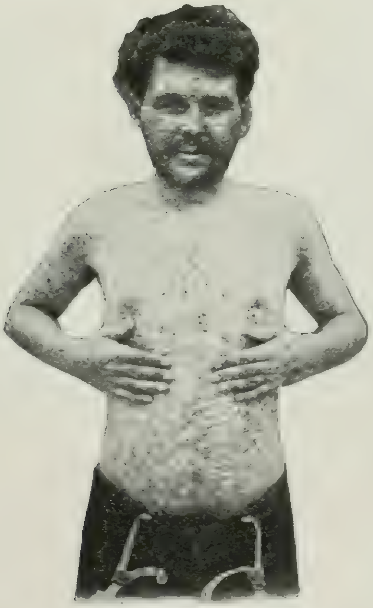
No. 1. Case in Sudbury Isolation Hospital.



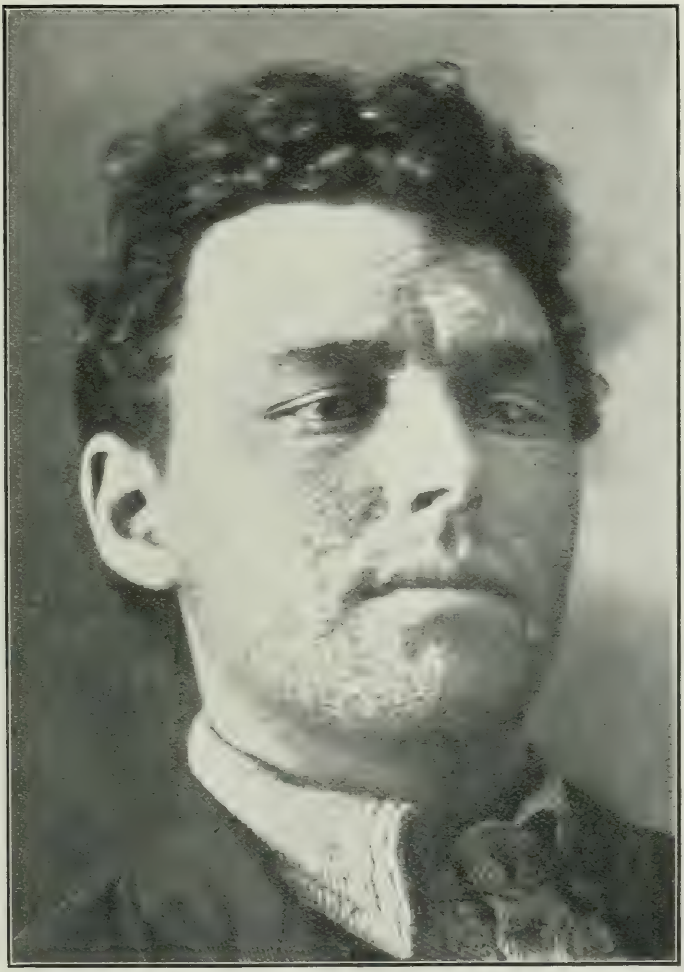
No. 2. Case in Sudbury Isolation Hospital, pustular stage.



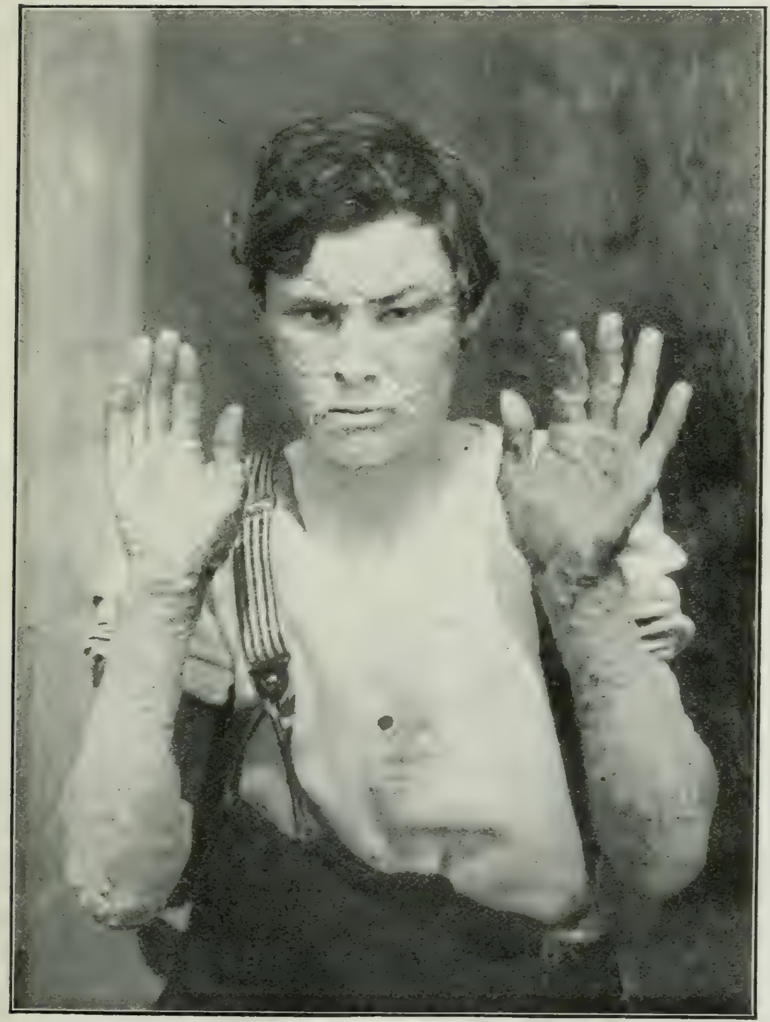
No. 3. A shantyman (unvaccinated), early pustular stage.



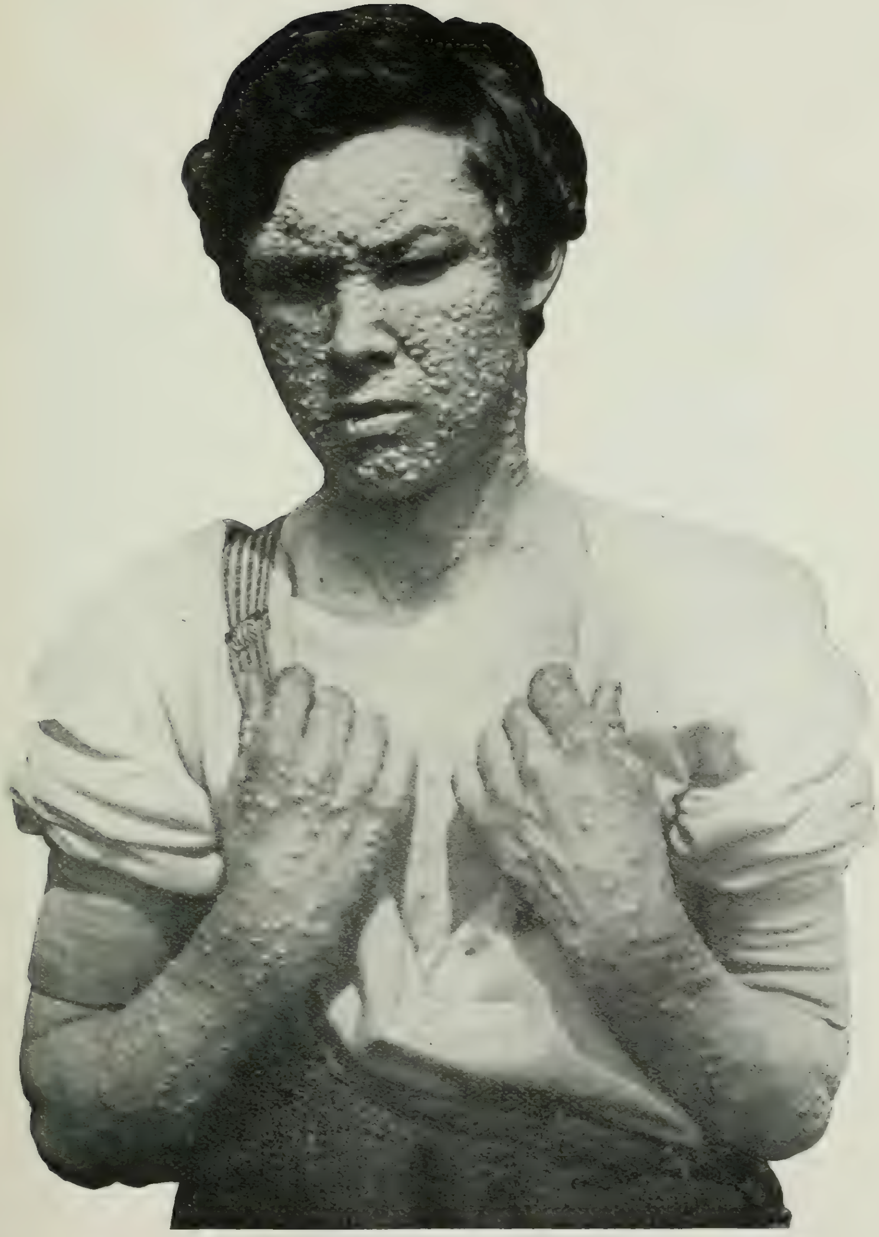
No. 4. Same case, desquamating.



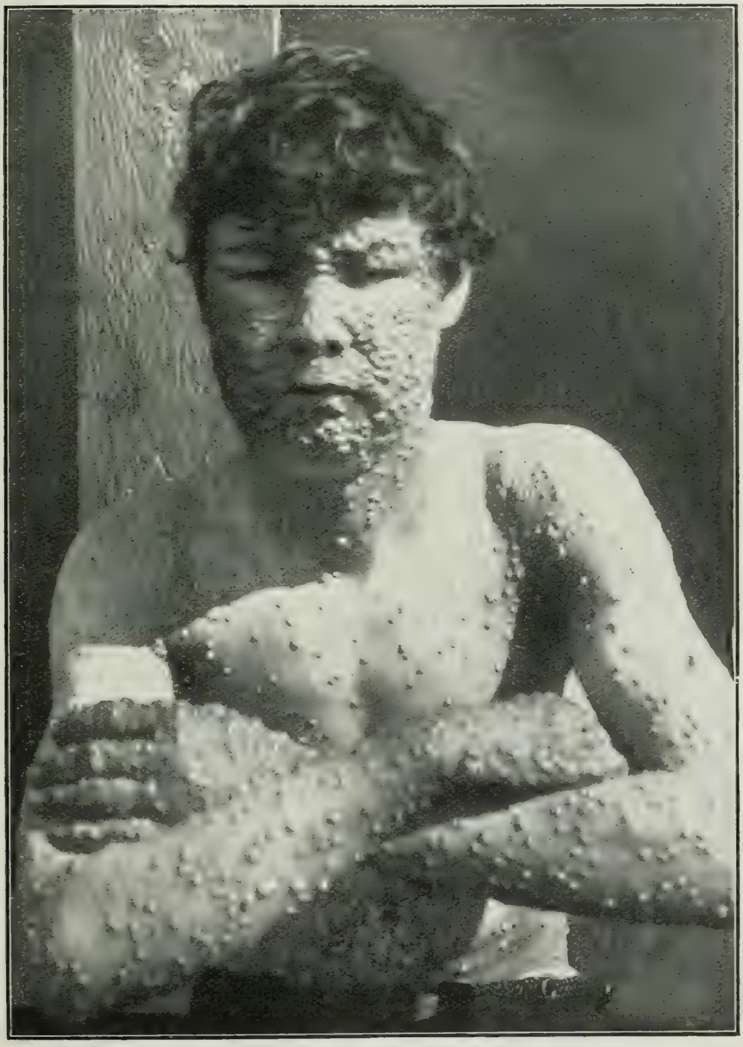
No. 5. Same case, showing pitting.



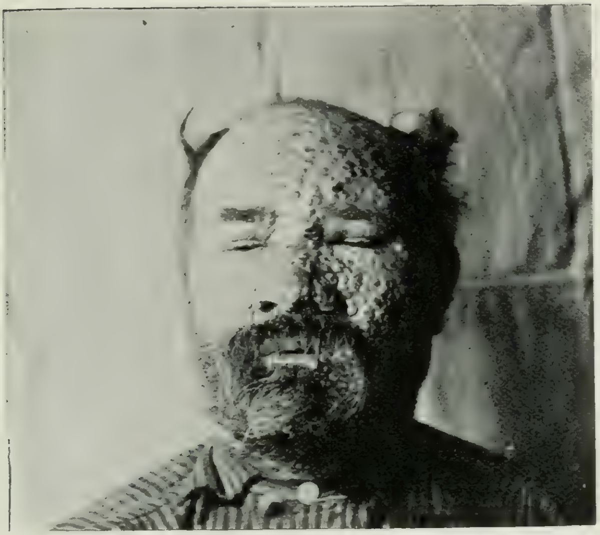
No. 6. Patient unvaccinated, late vesicular stage.

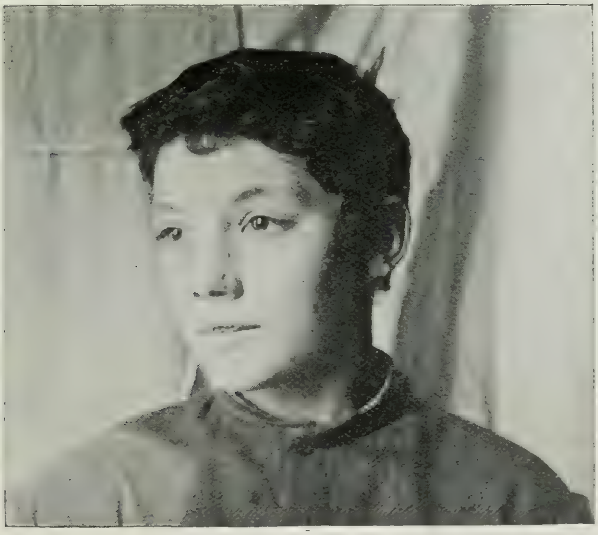


No. 7. Same patient, pustular stage.

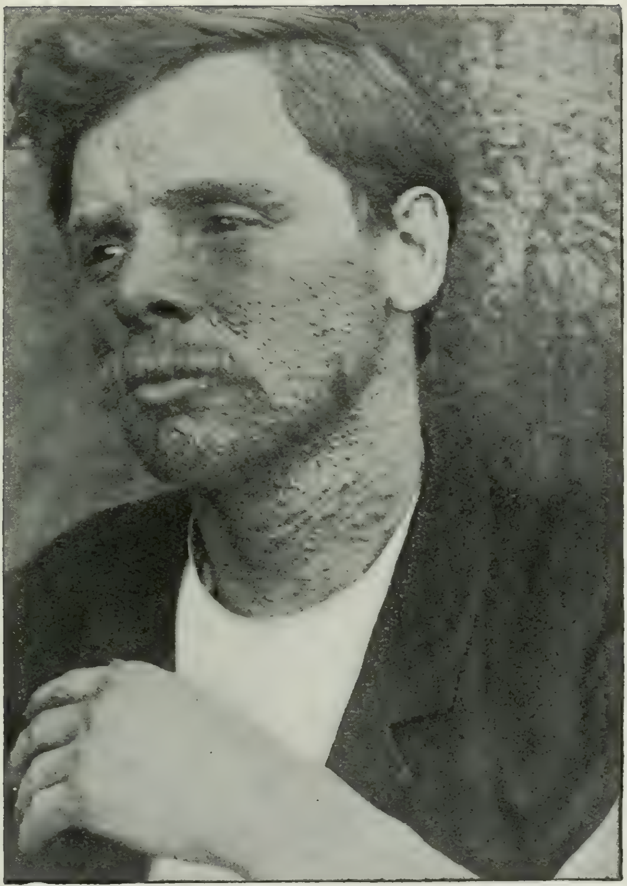


No. 8. Same patient, showing extensive inflammation.

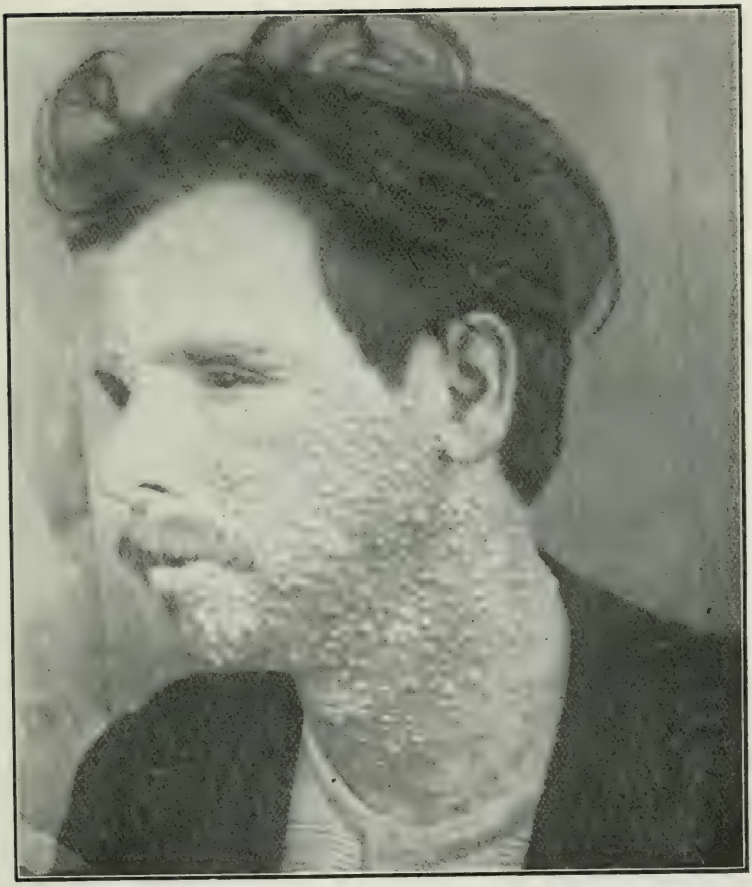




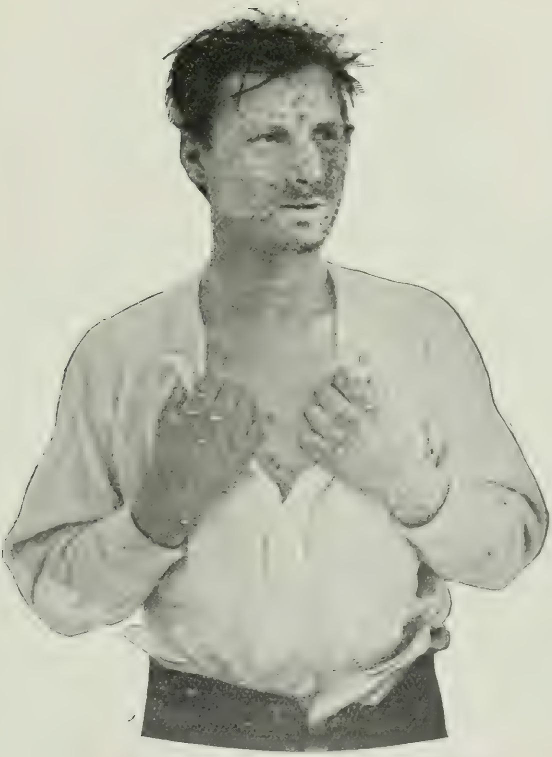
Nos. 9 and 10. Father and son (both unvaccinated), same infection.



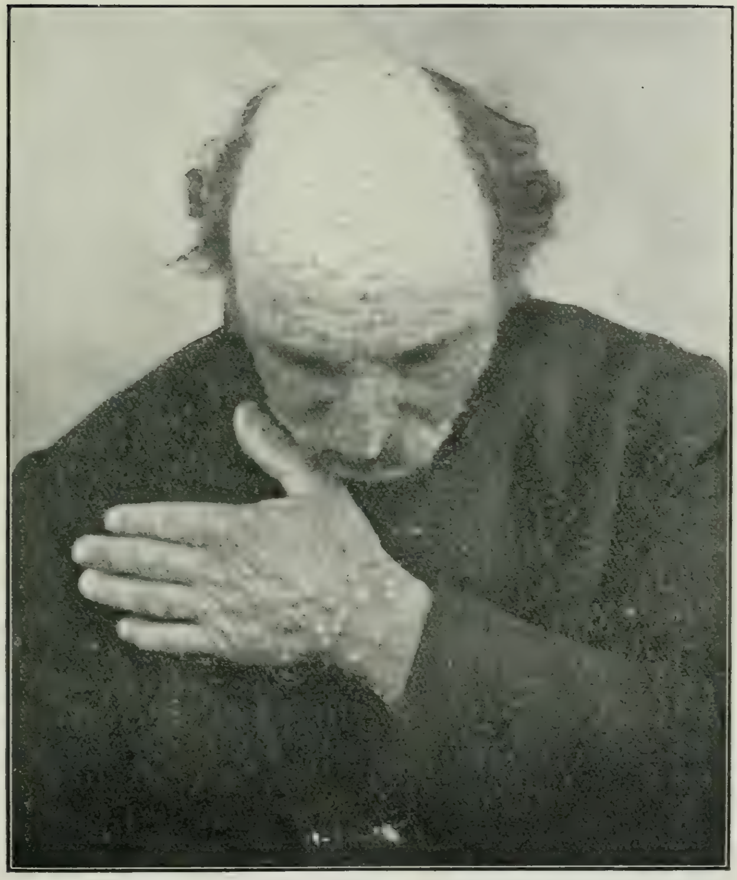
No. 11. Illustrates the vesicular stage of eruption.



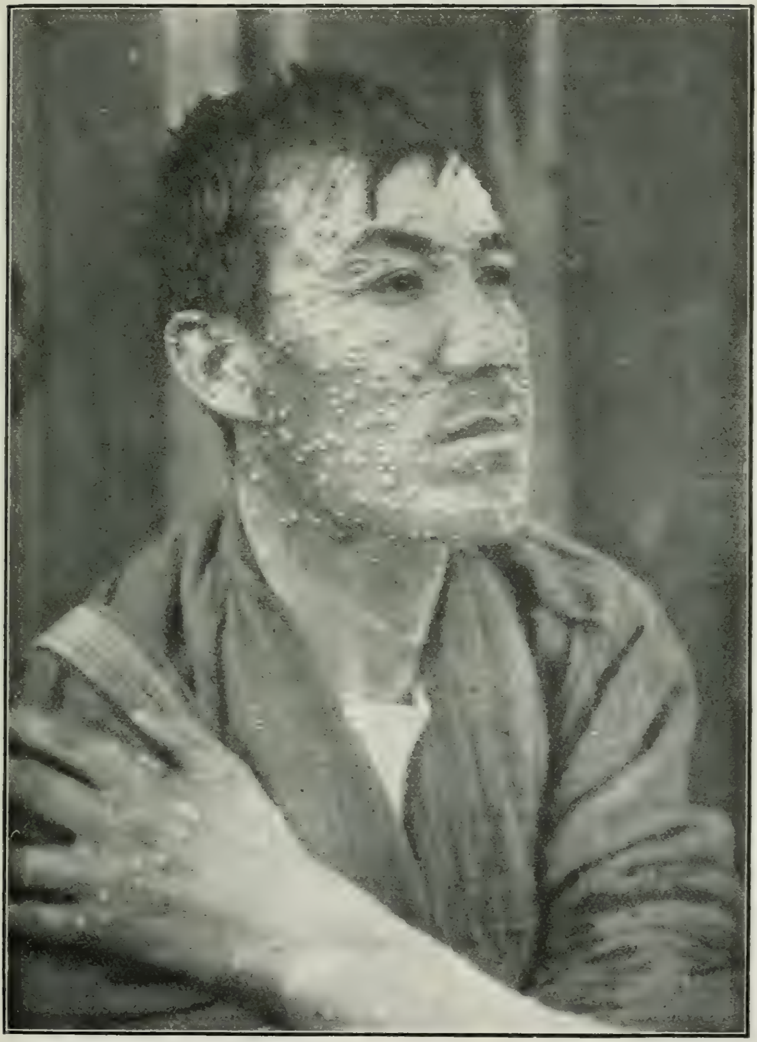
No. 12. Same patient, in pustular stage.



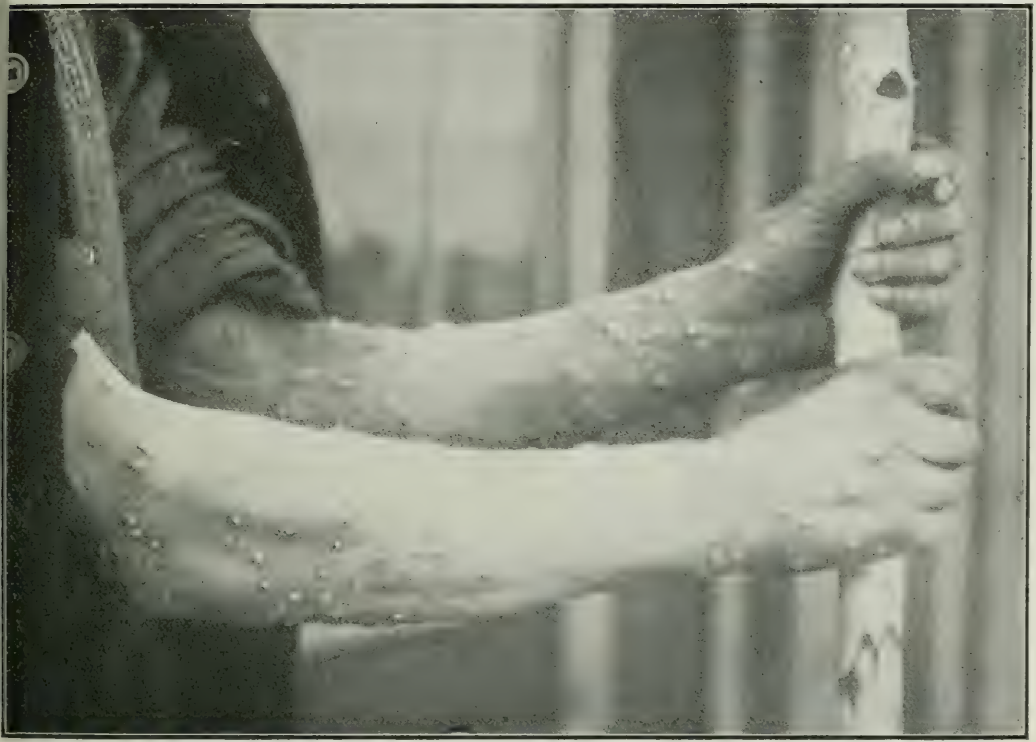
No. 13. The contrast between eruption of hands and face are well shown.



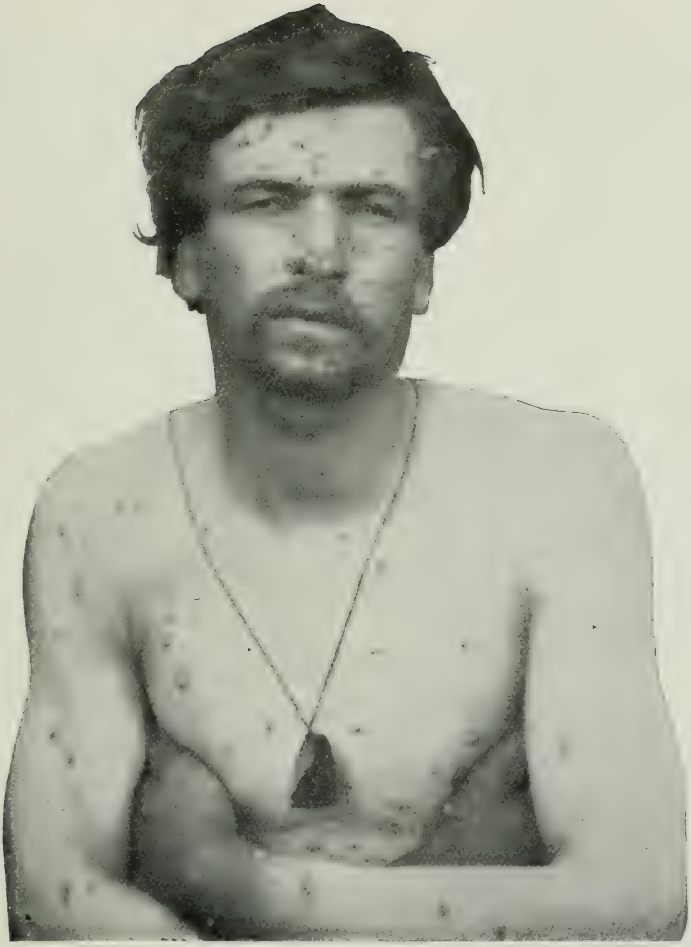
'No. 14. An example of acne-like form with inflammatory base.



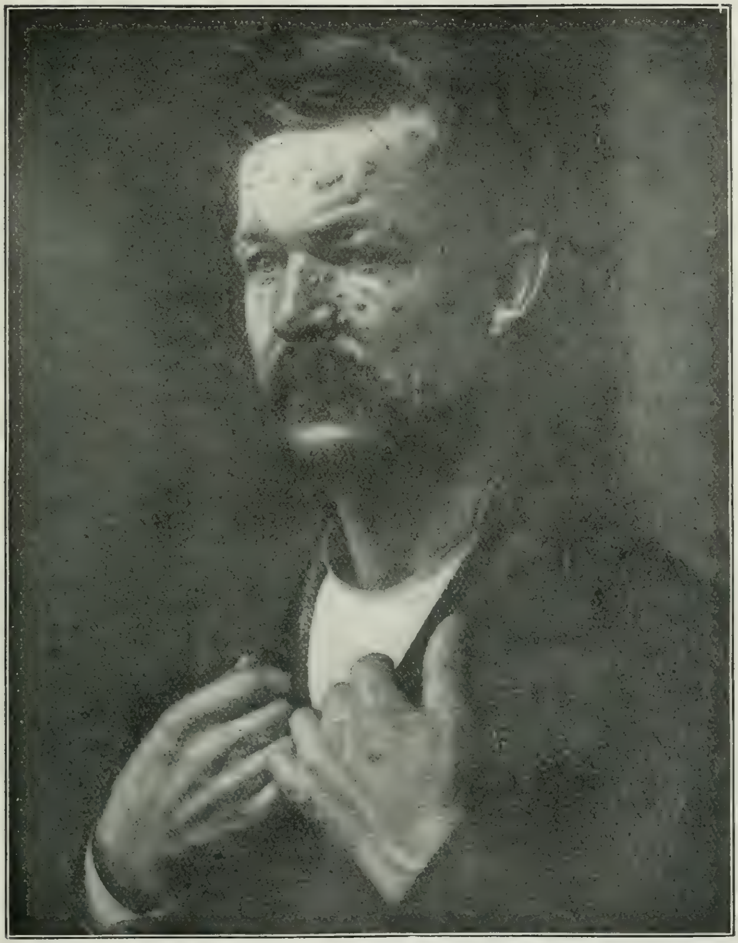
No. 15. The pustular stage as seen in an unvaccinated Indian.



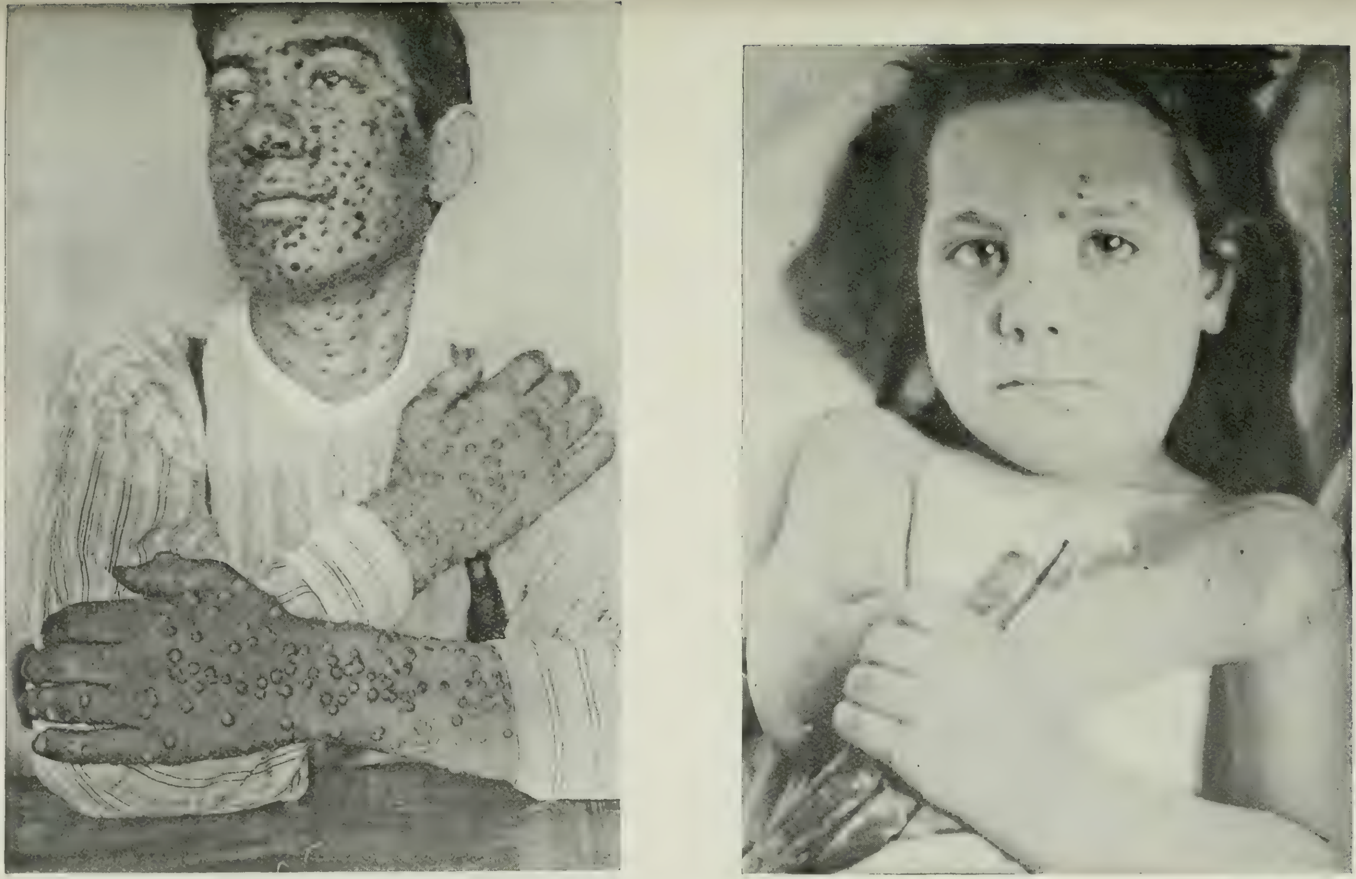
No. 16. Same case, showing distribution of eruption on forearms.



No. 17. An example of a discrete case in pustular stage.



No. 18. Example of case of smallpox incorrectly diagnosed as Impetigo Contagiosa.



Nos. 19, 20. Brother and sister (both unvaccinated), the former shows the aborted condition of rash on face, and well-marked pustules on hands. Sisters case mistaken for chickenpox.

past two years have been directly traceable to an outside origin. The work done in New Ontario by the Provincial Board of Health is an example to all municipalities, for nothing was done except in conformity with the Act and Regulations; none of these was exceeded in any one particular. To their strict enforcement alone is due the results just stated, and I feel satisfied if the local authorities will but enforce the various provisions of the Act and Regulations, similar results are bound to follow when an outbreak is threatened.

The returns for the several years are as follows:

	Cases.	Deaths.
1900	300	11
1901	1,838	7
1902	2,797	12
1903	820	21
1904	309	4
	5,765	51

which is record of 5,765 cases, with 51 deaths, and a case mortality of 0.88 per cent.

To emphasize the fact that the disease has heretofore been of a severe type, I would quote the words of Dr. Moore, the historian, of smallpox. He says:

"The confession that must be made is mortifying to a professional man, for, according to such records as we possess, it appears that, in spite of all medical exertion, the mortality of smallpox had progressively augmented. It has been made evident by calculations from the bills of mortality of the City of London, renowned for medical science, that at the beginning of the eighteenth century about one-fourteenth of the inhabitants died of smallpox, and during the last thirty years of that century, when the practice in smallpox was highly improved, the mortality by this disease had augmented to one-tenth.

"But this immense and increasing consumption of human lives was not the sole evil produced by this distemper, for a considerable proportion of the survivors were pitted and disfigured; some lost one of their eyes, a few became totally blind, and others had their constitution impaired, and predisposed to a variety of complaints, which were productive of future distress, and sometimes of death. These additional calamities cannot be reduced to calculations, but as the mortality from smallpox was continually on the increase, these concomitant evils must have been so likewise."

Coming to recent dates we find the type of the disease in the City of Montreal, in 1885-6, and of which Osler in his "System of Medicine" writes, was of a like similar character to what preceded it. There were 3,164 deaths, and of the 1,332 treated in the hospital, 418 died, a fatality of 31.3 per cent. In Ontario, during the years 1884-99, the following is the record of cases and deaths:

Year.	Place	Cases.	Deaths.	Per cent.
1884	Hungerford Township	202	67	33.0
1885	Province (Generally)	146	16	10.9
1889	Elgin County	49	13	28.9
1899	Russell County	30	9	30.0
		429	105	24.45

Or an average mortality of 24.45 per cent.

DESCRIPTION OF ILLUSTRATIONS.

For the more careful study of the disease the accompanying illustrations are appended. The cuts are made from photographs taken in different portions of the Province during the past five years, and are fully illustrative of most of the types that have been met with.

Nos. 1, 2 were amongst the first cases quarantined at Sudbury on suspicion after the disease had been prevalent for some months though incorrectly diagnosed. No. 1 shows a few pustules on the exposed parts, while in No. 2 is illustrative of the disease of the discute type in the pustular stage and had been diagnosed as of specific origin—neither of the patients (1, 2) had been vaccinated and both contracted it from the same source.

Nos. 3, 4, 5 are of a shantyman (unvaccinated) in whom the disease ran a very severe course, the secondary fever running over 104° F. In No. 3 the rash is shown just as the vesicles are changing to pustules. No. 4 is that of the same patient in the stage of desquamation while the pitting is well seen in No. 5, taken the day the patient left the hospital.

The next three illustrations show the progress of the disease in the same patient (also unvaccinated). In No. 6 some of the vesicles are assuming the pustular appearance; in No. 7 the disease has advanced to the pustular stage while in No. 8 the inflammatory condition found in the stage of secondary fever is well illustrated.

The examples, 9 and 10, are father and son, both unvaccinated, who both contracted the disease from another member of the family—in whom it had been diagnosed chickenpox. The child had but few pustules, while in the father the disease was quite typical—they were both in the same stage of the disease.

The patient 11 and 12 was a shantyman, (unvaccinated), the first illustrates the vesicular stage which is shown very well on the face. And in the second the pustular stage is quite marked. The brooch on the pomum adami is interesting as showing how the discrete vesicles in 11 become confluent pustules at the late stage.

In No. 13 (unvaccinated) is seen a good example of the aborting of the pustules on the face, presenting a condition which has frequently led to a diagnosis of chickenpox. On the hands the disease is seen in as the well marked pustular form, some of the pustules being confluent.

The next illustration, No. 14, unvaccinated, shows in a very marked manner a common form for the eruption to assume. In this case the papules developed into elevated cones crowned with acne-like black spots which were accumlatives of seropurulent fluid. These subsequently dessicated, leaving the solid portion like warty excrescences which, however, subsequently disappear. These "black heads" are seen more markedly on the head, some few can be seen on the back of the hand.

The next two Nos., 15 and 16, show the eruption as it appears on the twelfth day when the patient, an Indian (unvaccinated), had a secondary fever of 104° F. The general distribution on the face is well shown, while No. 16, taken the same day, is a good example of discrete smallpox as seen on the forearm and hands, though No. 17, (unvaccinated) is perhaps more typical of the general run of cases as they have been seen in Province. All of the last seven illustrations were of shantymen quarantined in the Government Hospital at Sudbury.

The next illustration No. 18, is that of a patient whose case was diagnosed at New Liskeard as suffering from impetigo contagiosa, and is given to the profession as a warning. To any one at all familiar with both diseases there can be no doubt as to it being a case of discrete smallpox, and from the appearance of some of the pustules on the face it would seem as if some of them simulated the condition described as being present in No. 14.

The remaining illustrations are of cases of smallpox which happened in the eastern portion of the Province, Nos. 19 and 20 being those of a brother and sister, both unvaccinated, and exposed to the same infection. The little girl is a typically mild form of which no doubt there have been thousands in the Province, while the brother presents the disease in a more marked form. The pustular stage as shown on the hands being in contrast with the character of the rash as found on the face where it has aborted. The contents of the vesicles having become muco-purent and in some places presenting the appearance of crusts.

Quarterly Report of the Secretary (1905).

CHAS. A. HODGETTS, M.D.

PRESENTED AT THE MEETING HELD AUG 2nd AND 3rd, 1905.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—The statistical report for the quarter ending June 30th, 1905, is perhaps as complete as any that has been placed before you for some time, due to the fact that the chief clerk has been making a special effort to secure from all the Division Registrars the monthly returns on or before the fifteenth day of each month, and the result is shown by the fact that 90 per cent. of the total population has been reported upon for the last six months.

From information received it would appear that in many municipalities physicians fail to comply with Section of the Public Health Act in not notifying of each and every case of the contagious diseases referred to therein, particularly is this the case with enteric fever, which disease a large number of medical men fail altogether to report; often the fault is chargeable to the local board of Health which fails to comply with Rules 1, 2 and 3 of By-law 17 of Schedule B of the Act and does not supply physicians with a proper blank form—were this the case then possibly medical men would more freely comply with the Act.

Applications are frequently made to the office for the blank forms referred to in the Act, and it appears to me that possibly this Board might consider the advisability of providing physicians generally with blank forms upon which to notify Local Health authorities of cases of contagious diseases. This might be done by the Board notifying local authorities, that it is prepared to supply such forms free of cost to local authorities, the only provision being that they must stamp each with the necessary postage before supplying them to physicians. If this course is pursued I believe as a result of the uniformity, more complete returns will be made.

The table of returns compiled by Mr. Lindsay, chief clerk, are herewith submitted, and a study of the same indicates that a marked increase is shown in the number of cases of measles a disease which it is not compulsory to notify. No less than 1,794 reported cases indicates that it has prevailed in epidemic form, for many thousand cases must have occurred of whose existance there has been no record. The deaths have numbered 39 being 28 over those of the preceding quarter. As to the cause of this epidemic, I am of the opinion it is mainly due to infection spreading from the newly arrived immigrants, thousands of whom have spread over this Province, for upon several occasions the Board has been notified by the Dominion Health Authorities that cases of measles have been reported by some of the vessels arriving at quarantine.

Regarding smallpox it may be said that this disease has been more prevalent than during the corresponding quarter of 1904; largely due to the fact that the public suppress notification to either physicians or the local health authorities, and too often the former when called in fail to arrive at a diagnosis either from ignorance or with intention to controvert the law, both of which at the present day, after some five years continuance of the presence of mild smallpox in he Province during which time they have had ample opportunity to become acquainted with its chief diagnostic features, amount to criminal negligence.

That such is the case the reports presented by Dr. Bell, Medical Inspector, clearly indicate and the action of the offending physicians calls for the severe censure of this Board.

It is pleasing to note that scarlatina is declining month by month and the number of cases for the quarter is less than that of either the corresponding quarters of 1903 or 1904, the figures being as follows:—983, 408, 342, respectively.

The peculiar feature regarding diphtheria is its almost standard number of reported cases. The returns for the same quarters of the past three years are 599, 582, 644, the case mortality of the last quarter having been 13.5 per cent.

The deaths from tuberculosis have numbered 605 and yet nothing has been done to stem its onward march. Surely the sepulchral tombs of so many of our flesh and blood which have been dotted over the Province during the past three months will stir from their lethargy some of the municipal authorities in Ontario and stimulate them until they see the necessity, the urgent necessity, which exists for the erection of municipal sanatoria, and the providing in some manner for the home treatment of the thousands who at present await the death call of this cruel disease—made more cruel by reason of municipal inertia, indifference and neglect.

It is really marvellous that so little has been done when we consider the wide spread character of this contagious disease and the persistant monthly death roll which we have to record, a mortality from the one single preventable disease for which measures of a prophylactic character have not been enforced, and one which in its onward progress leaves only distress, suffering, privation and misery, examples of which are to be found in every municipality in this province, the rich, the poor, the educated and ignorant, men and women, young men and maidens, children and babes, all alike suffering, and in their suffering sending up such a wail that it is heard in every work-shop and factory and in every home in the land.

The financial loss during the past three months on account of medical attendance, nursing, medicines, extra food, funeral expenses, moving of relatives and loss of wages may be set down as not less than $500.00 each, thus representing a loss of $302,500 to this promise alone, during the past three months equal to a tax of only fifteen cents per head of the populaion in which the deaths occurred—a sum which would have erected six sanatoria capable of accommodating at least 600 patients.

Here is witnessed the deplorable fact that the public endure this continued grievous and irreparable loss with incidentally its financial drain, without an effort being made to prevent it—they spend $300,000 every three months in caring for and mourning the loss of 600 relatives and friends without making any effort to provide for the stemming of the progress of this disease.

Contrast this with the death of 600 head of cattle from glanders, where the financial loss would have been only about $50,000 and minus human suffering and privation, yet what a cry human avarice would have aroused demanding instant action being taken in the interest of farmer and capitalist.

Even the fraternal societies and insurance companies of this country are infected with the inertia and must during the quarter have paid out many thousands of dollars for sick and funeral benefits on behalf of those who have died of the white plague, while many more must have been paid to the relatives on account of death claims. All this—and more too, for the full tale can never be told and yet the grim reaper claims his increasing quota of consumptives.

The one bright spot is the fact that the County Councils of Perth, Wellington, Oxford, Waterloo and Brant have appointed representatives to confer upon the erection of a sanatorium at a suitable place in one or other of the counties, upon which to erect buildings which will be adequate to care for the indigent consumptives, and already a sub-committee has conferred with the Hon. the Provincial Secretary and received from him expression of the most hearty approval of the plan, and he assured them of financial aid in the erection and equipment of the sanatorium.

As further proof—That the question of the suppression of Tuberculosis is receiving more attention than has heretofore been accorded it, I have pleasure in submitting the minutes of the proceedings of The Senate of Canada of July 12th, 1905, when the Report of the Joint Committee of the Senate and House of Commons was considered and adopted.

The Honourable Mr. Edwards, from the Joint Committee of the Senate and House of Commons, appointed for the purpose of considering what further steps should be taken and what suggestions can be made in the direction of the suppression of Tuberculosis in Canada, presented the First Report.

Ordered, That it be received, and

The same was then read by the Clerk, and it is as follows:—

THE SENATE,
COMMITTEE ROOM No. 8,
TUESDAY, 11th July, 1905.

To the Honourable the Senate of Canada:—

The Joint Committee of the Senate and House of Commons appointed for the purpose of considering what further steps should be taken and what suggestions can be made in the direction of the suppression of tuberculosis in Canada, with power to send for persons, papers and records and to report, have the honour to report, as follows:—

1. The Canadian Association for the Prevention of Consumption and other forms of tuberculosis, and various organizations of the same character in Canada, and prominent medical men were invited to make such suggestions as they might deem advisable on the question which was the subject of reference to this Committee, and valuable suggestions and a large amount of information have been received, and have been made use of by your Committee.

2. Until quite recently tuberculosis was regarded as generally hereditary and incurable, but modern discoveries have established that it is a communicable disease, and to a large extent curable as well as preventable.

3. There is in Canada a permanent corps of consumptive invalids, numbering at least forty thousand persons, of whom over eight thousand die annually. In the Provinces of Ontario and Quebec it is an ascertained fact that the deaths from tuberculosis alone are more than twenty-five per cent. greater than from diphtheria, scarlet fever, typhoid fever, measles, and whooping cough combined. Apart from the humanitarian considerations involved in the question, the financial loss alone entailed upon Canada by such an annual mortality is enormous, estimated by competent authorities at over $8,000,000 a year, which makes it imperative for the State to adopt the best possible measures of prevention and cure.

4. The problem of tuberculosis involves a social movement which does not affect one province, but all provinces; one district, but all districts; one class, but all classes in the community, in country as well as in town. It is a movement of so wide a character that, for it to have adequate practical results, the co-operation of the central Government is absolutely essential.

5. The principle involving the interference of the Dominion Government for the suppression of diseases of this kind was recognized immediately after Confederation, and is embodied in the statutes of 1868, 31 Victoria, Chapter 63, from which the following is extracted:—

"7. Whenever Canada, or any part thereof, appears to be threatened with any epidemic, endemic, contagious or infectious disease, the Governor may, by proclamation, make such regulations as he thinks proper and necessary to prevent the introduction of such disease from beyond the limits, or to prevent its spread within the limits of Canada, and otherwise protect the public health, and he may, from time to time, revoke or amend the same, or make others in their stead in like manner, and may impose penalties, forfeitures and punishments for the breach thereof, and such regulations shall be published at least twice in the *Canada Gazette*, and the production of copies of the *Gazette* containing such proclamation, shall be evidence of the making, date and contents of such regulations.

"9. By such regulations the Governor in Council may appoint for any specified time, one or several 'Central Boards of Health' and may name the members thereof, and also such medical and other officers and such servants as he may deem necessary to assist such boards, and the powers and duties of the said boards shall be such as are affixed to them by such regulations, and may be exercised by any number of the members thereof mentioned in the said regulations, as constituting the quorum thereof; and the powers and duties of such boards shall cease on the revocation or at the time of the expiration of the regulations aforesaid.

"10. When, and so long as such regulations are in force, it shall be the duty of every Municipal Corporation or County Sessions within Canada to organize a 'Local Board of Health' for the limits of their respective jurisdictions, and such 'Local Boards' or any three members thereof, shall have power to act under the regulations aforesaid, and the direction of any 'Central Board of Health,' designated in such regulations, and the duties of such Local Boards of Health shall be to enforce generally all sanitary measures required, and to carry out the regulations of the Governor in Council, and such orders as may be issued by the 'Central Boards' in pursuance of the provisions of such regulations.'

"11. In the case of Municipal Corporations or County Sessions neglecting or refusing to appoint a Local Board of Health as aforesaid, or in the absence of any such authority in any locality, the Governor in Council may nominate persons within the limits of such Municipal Corporation, county or locality, to constitute such Local Boards of Health."

6. The problem of preventing and curing the disease is exceedingly complex and necessarily entails a very large expenditure. The work may be taken hold of by the Dominion Government or by the Provincial and Municipal authorities with the aid of the Dominion Government.

7. In the opinion of your Committee the Federal Government should be prepared to contribute yearly to each province a considerable share of the annual cost of dispensaries, inspections, the erection and maintenance of sanatoria and whatever other agencies may be found necessary to secure the desired end; the Province, municipalities, individuals and benevolent associations contributing the balance; the Federal Government to prescribe the conditions upon which the several institutions shall be entitled to their share of the subsidy and also to have the right of inspection of each institution and of its books at any time, and also power to withhold its contribution in respect of any institution not fulfilling its requirements.

8. Your Committee further suggest that unless the Dominion Government feels prepared to take hold of the matter itself, a conference should be held at as early a date as possible, between the Federal and Provincial authorities, for the purpose of determining the best action which should be taken in the premises.

9. Your Committee suggest that the recommendations embodied in the present report be presented to the Governmnt by a joint delegation of both Houses; and that their attention be again called to the resolutions passed unanimously by the Senate and by the House of Commons respectively, of which copies are hereunto annexed.

All of which is respectively submitted.

Wm. C. Edwards,
George H. Perley,
Joint Chairmen.

Resolution of the Senate. Passed Thursday, 6th April, 1905.

That in the opinion of the Senate the time has arrived when the State should take some active steps to lessen the wide spread suffering and the great mortality among the people of Canada, caused by the various forms of tuberculosis, and that a conference between the Dominion and Provincial Governments should be had at the earliest possible moment in order that the best mode of action in the premises be adopted.

Resolution of the House of Commons. Passed Monday, 20th February, 1905.

That in the opinion of this House the time has arrived when Parliament should take some active steps to lessen the wide spread suffering and the great mortality among the people of Canada, caused by the various forms of tuberculosis.

On motion of the Honourable Mr. Edwards, seconded by the Honourable Sir William Hingston, it was

Ordered, That the said Report be adopted.

With leave of the Senate.

The Honourable Mr. Edwards moved, seconded by the Honourable Mr. Béique,

That a delegation of the Senate be appointed to wait upon the Government, together with a like delegation from the House of Commons, to present a copy of the Report which has been adopted this day in connection with tuberculosis, and

That the said delegation be composed of:

The Honourable Sir Mackenzie Bowell, K.C.M.G., the Honourable Sir William Hingston, Kt., the Honourable Messieurs Béique, de Boucherville, Casgrain (Windsor), Edwards, Ellis, Fiset, Godbout, Kerr (Toronto), McMillan, Robertson, Sullivan, Wilson and Young.

The question of concurrence being put thereon, the same was resolved in the affirmative, and

Ordered accordingly.

On motion of the Honourable Mr. Edwards, seconded by the Honourable Mr. Béique, it was

Resolved, That a message be sent to the House of Commons by one of the Masters in Chancery to inform that House that a delegation of the Senate has been appointed to wait upon the Government, together with a like delegation from the House of Commons, to present a copy of the Report which has been adopted this day in connection with tuberculosis, and

That the said delegation be composed of:

The Honourable Sir Mackenzie Bowell, K.C.M.G., Sir William Hingston, Kt., the Honourable Messieurs Béique, de Boucherville, Casgrain (Windsor), Edwards, Ellis, Fiset, Godbout, Kerr (Toronto), McMillan, Robertson, Sullivan, Wilson and Young.

It is mainly due to the efforts of the Canadian Association for the Prevention of Consumption and other forms of Tuberculosis that this question has been taken up by both Houses of the Dominion Government, and it is to be hoped it will cause in some definite line of action being suggested which will result in Government aid being given to municipally owned and managed sanatoria and dispensaries—removing for ever the care of the consumptive from the hand of charity and placing it upon the line of a municipal responsibility, leaving, however, a large field open for those desirous of providing for that large class which is able to pay for their treatment in well equipped and properly managed private sanatoria, which, however, should be under Government supervision without state aid.

Before leaving this most important subject I would wish to refer to the fact that it is being falsely represented to municipal authorities, that the voting of a few hundred dollars by them towards the endowment of a bed for one year in what is called the Free Hospital for Consumptives, which is for the use of one indigent patient, is a solution of the question of municipal responsibility re the care of consumptives. The experiment has simply to be made, when it will be found that it is far from satisfactory and the fact being known that a particular municipality has endowed (?) one bed brings out at least a score of applicants each with influential friends who are convinced of the fact that theirs is the most deserving case.

The treating of the question in this manner is not along the lines as laid down in the Act of 1900 re Municipal Sanatoria, and which the Government is prepared to stand by, it is merely a poor travesty of this important question. Witness the City of Toronto being recommended to grant $2,000 for the care of its indigent consumptives, merely the interest on the $50,000 which was voted some years ago towards the erection of a municipal sanatoria by the City.

Medical Inspector. The work of Dr. R. W. Bell, Medical Inspector of the Board has been of such a character as to carry him to the extreme western limits of the Province, and his time has been fully occupied not only with the diagnosing of suspected cases of Smallpox and the directing of municipal health machinery, but in many other ways as set forth in the report which he will personally present.

The Laboratory. The work during the quarter has been of the usual routine character, but additional interest is apparently being taken by medical men generally in the opportunities afforded by the bacteriological (diagnostic) work. Of the special scientific experiments under way Dr. Amyot will report upon in detail.

MISCELLANEOUS.

The following items of interest to the Board having presented themselves during the quarter may be mentioned.

An Act to amend the Public Health Act.

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. *The Public Health Act* is amended by adding thereto the following section:

72*a*. No person shall keep or store any rags, bones or other refuse in any building used as a dwelling, or upon any premises within the municipality unless the same are kept or stored in a suitable building, approved of by the Medical Health Officer.

Municipal Control of Slaughter Houses. From the experience of both your Secretary and the Medical Inspector there would appear to be a great need for a more careful oversight of slaughter houses throughout the Province generally, for not only have we found marked instances where there has been apparently a marked disregard of the by-laws as found in Schedule "B" of the Public Health Act in so far as they relate to the same, but in many municipalities blood offal and meat of dead animals are fed to hogs without having been previously boiled or steamed as required by sub section 8, section 108 of the same Act. This unsatisfactory condition results, as might be expected in an unsanitary condition, and too often is it the case that meat offered for sale has been slaughtered and dressed in environment the most disgusting and in a manner which possesses none of the elements which would indicate that even the first rules of cleanliness were observed by many of those carrying on the business.

SEWERAGE AND WATER.

Installing of Systems without Approval. Your attention was directed some time last year to the growing tendency on the part of both sanitary Engineers and Municipal Authorities to install either or both kind of systems without having first received the approval of this Board as per section 30 of the Public Health Act.

I now desire to submit for your consideration three instances where the plans as submitted have been submitted to the Board and failed to secure its approval, yet in both instances the Board has been ignored. Palmerston made application for the approval of a plan for a sewerage system which was disapproved. (See Report No. 13, (1904), Committee on Sewerage.) And yet the municipality and engineer have installed the system.

It will be remembered that Rat Portage similarly applied for permission to drain into Laurenson Creek and was refused. From a memorandum received from the Inspector it would appear that the municipality has ignored the Board and run the sewage into the creek at a point lower down the stream than proposed instead of running it into the general system. See Report No. 15, Committee on Sewerage, 1904.

The third case which I would bring before your notice is that of Burk's Falls, which has installed a public water supply without this Board having had plans, etc., submitted to it. It appears that Dr. Bryce visited the town and together with some of the municipal authorities went over the ground and informally approved of a certain scheme whereby he personally was of the opinion a good supply of water could be obtained. The Town Council never submitted plans to the Board, but proceeded to install the system on the plan recommended by Dr. Bryce.

It is now found that the water during the winter months is unfit for domestic purposes by reason of its peculiar odor, and as a result many of the inhabitants refuse to use the same. The municipal authorities having made application for an investigation of the system, Dr. Amyot visited the town and his report will be considered at this meeting together with his recommendation.

These examples of breaches of the Act are, I think, sufficient to indicate that this Board should have the power of inflicting a fine upon those municipalities who do not comply with this requirement of the Health Act.

Prophylaxis in Mental Diseases. With particular pleasure the fact is to be noted that there is good reason to expect that a new departure will shortly be made in what may justly be claimed as belonging to preventive medicine, viz., the providing for the care of patients suffering from those nervous conditions which are now known to be the prodromata of chronic mental diseases.

The question was presented to the Ontario Medical Association by Dr. D. Campbell Meyers, and a committee was appointed as a deputation to present the claim before the Hon. Mr. Whitney. Two of your members had the pleasure of being present on that occasion when it was pointed out how provision in the way of special hospital wards would not only fill a long felt want, but would often prevent the progress of certain nemotic affections to chronic mental ones and in this manner considerable expense would be saved the province in the way of permanent asylum provision.

In view of the fact that 876 "lunatics" were admitted into the Provincial Hospitals for the Mentally Diseased during 1904, and the average daily population the same year had been 5,500 and that there were now 14 insane in every 5,000 of the population of the province, it is nothing but proper that the Board should give expression of approval to this proposal so properly brought before the notice of the Government, the profession and the public by Dr. Meyers.

A WARNING RE TYPHOID FEVER.

Water Supplies. For the benefit of the Province generally I wish to warn all that the closest inspection should be made of drinking water no matter from whatever source it is derived. Be not deceived by the fact that your drinking water is clear and cool and from a spring, or that the situation of the well is all right, or that the town or city water has always been good, pollution will, and does take place by reason of surface pollutions, by animal or man, by underground infection from cess-pool or pit, and in the case of municipal supplies by both the above causes and through the impregnation of the water by sewage, either before reaching the intake pipe or at some point in the line of pipe particularly so when the water is drawn in by suction and does not reach its destination by gravity or force.

It, therefore, behoves both the public and the physician to keep the closest watch on the water supply by collecting and sending suspected samples to the laboratory through the M. H. O.

At the same time the Local Authorities should provide the necessary forms upon which physician should be required to notify of all cases of enteric fever.

I would recommend that the article on the use of septic tanks and subsurface irrigation for the disposal of the sewage of farm houses, etc., lead by Mr. M. Quinn, before the executive Health Officers' Association of Ontario, last year be printed and distributed throughout the farming districts through the various Institutes and Associations.

Epidemic Cerebro-spinal Meningitis. When reporting last quarter upon epidemic Cerebro-Spinal Meningitis several fatal cases were reported as having occurred in Russell County.

I have now to report further upon the subject, having recently visited Carp, in the County of Carleton, upon the invitation of Dr. Groves, who has attended during the past few weeks eleven cases, four of which have proved fatal. The disease has prevailed almost entirely amongst children.

From the symptoms present in the cases seen in consultation with Dr. Groves, there could be no doubt as to the diagnosis, the typical symptoms being present, and, so far as I could learn, the physicians in charge of the cases agreed.

The report received from Dr. Groves indicates there have been in his practice alone, eleven cases with four deaths, and as M. H. O. he states there have been several others in the districts.

The cases seen in consultation were under quarantine, the local authorities having availed themselves of the powers of section 85 of the Act and have placarded the houses in which the cases exist, and I would recommend that this Board by resolution approve of similar action being taken wherever this fatal disease exists.

I shall at the earliest opportunity present a more detailed statement regarding the outbreak.

MILK PRESERVATIVES.

A short time ago considerable discussion occurred in the public press caused by the discovery of the M. H. O. of the City of Brantford of the use of preservatives by the milk dealers of that City. The particular adulterant was a proprietary article sold as "Frezine."

After an interview with the M. H. O. and Solicitor of Brantford, a letter was sent to the M. H. O.'s of the cities of the Province, and from the replies received it would appear that, speaking generally, the milk supply of our cities is good and free from adulterants.

It is a fact, however, that certain proprietary preparations are on sale in the Province which are of the nature of adulterants, and therefore if the Department of Public Health, and that of the Inland Revenue at Ottawa, were fully alive to the situation, the importation of such preparations would be prohibited.

The attention of the Dominion Authorities might be directed to the necessity for prompt action along these lines.

I have much pleasure in submitting to the Board the belated report of the M. H. O. of the City of Toronto. Acting as he does for a municipality containing one tenth of the total population of the Province, his report will be read with interest, particularly as it affects the health of the largest urban population in Ontario.

The chief points of interest are,—

(*a*) The advantages of a special hospital for contagious diseases.

The doctor's remarks on—

(*b*) Diphtheria—its variation in percentage, mortality, origin chiefly from pre-existing cases, variation of length of the disease.

(*c*) Scarlet Fever, its mild form, communication by families; length of infectivity.

(*d*) Disinfection, method adopted; formalin.

(*e*) Police court cases, 144.

(*f*) Report of Inspector of Food.

(*g*) Report of Dr. G. Tweedie, Med. Sup. of Isolation Hospital.

(*h*) Report of Bacteriologists on water supply and infectious disease.

The Report is most complete and interesting from a sanitarian standpoint, as it is descriptive of health work and the difficulties met with its administration in our largest city.

All of which is respectfully submitted.

Toronto, July 31st, 1905. CHAS. A. HODGETTS, Secretary.

CASES AND DEATHS OF CONTAGIOUS DISEASES BY QUARTERS FOR 1905.

First Quarter.

Diseases.	Cases.	Deaths.
Smallpox	34	0
Scarlet Fever	600	36
Diphtheria	905	129
Measles	541	11
Whooping Cough	103	12
Typhoid	142	56
Tuberculosis	559	534
	2,884	778

Second Quarter.

Diseases.	Cases.	Deaths.
Smallpox	124	2
Scarlet Fever	342	18
Diphtheria	644	98
Measles	1,794	39
Whooping Cough	117	21
Typhoid	111	47
Tuberculosis	625	605
	3,757	830

	Small-pox		Scarlatina		Diphtheria		Measels		Whooping Cough		Typhoid or Malaria		Tuberculosis		Total Deaths	Townships
1905	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths		Rate per 1,000
January	10	0	223	12	412	67	268	4	27	4	69	21	174	169	2,216	13.1
February	8	0	209	16	270	35	119	2	22	3	43	19	177	165	2,263	14.0
March	16	0	168	8	223	27	154	5	54	5	30	16	208	200	2,417	14.9
April	70	2	157	7	212	27	494	27	45	4	37	10	211	198	2,164	13.6
May	35	0	89	6	220	31	880	1	89	9	31	18	204	200	2,148	13.1
June	19	0	96	5	212	40	420	11	40	8	43	19	210	207	1,933	11.2

Average population reporting 1,974,260, being 90 per cent of the Province.

Laboratory Reports

By J. A. AMYOT, M.D,

PRESENTED AT THE QUARTERLY MEETING HELD AUGUST 2nd AND 3rd, 1905.

To the Provincial Board of Health of Ontario:

GENTLEMEN,—I have the honor to report to you as follows on the routine work done in your Laboratory during the quarter beginning April 1st and ending June 30th, 1905.

	Diphtheretic Swabs				Tuberculous Sputa		Typhoid Bloods		Miscell'ous Specimens	Waters		Total Number for Month
	Release		Diagnosis									
	+	—	+		+	—	+	—		Chem.	Bac.	
April 1905.	29	23	37	61	62	129	9	38	9	0	41	438
May 1905 .	12	21	23	44	58	127	13	36	9	0	68	411
June 1905 .	13	18	16	37	50	134	12	49	18	0	47	394
	54	62	76	142	170	390	34	123	36	0	156	1243
	334				560		157		36	156		

There were examined besides the above specimens

Toronto sewage	224
Toronto waters chemically	28
Disinfectants	5
Other chemical waters	8
Stratford sewage	6
Meat under question	10
Total specimens examined	1524

The numbers of specimens examined during this quarter outnumbers these examined during the whole of 1901 by narly 300.

The experiments in connection with the action of carbon monoxide is being vigorously pushed forward. We hope in the course of some months to be able to make you a very interesting report on our findings.

During the quarter forty-nine specimens of tap-water on as many days were examined especially for colon bacilli from the Toronto water supply. These organisms were found on three occasions, viz., on May 8th, May 30th and on June 23rd, 1905. Practically 6 per cent. were infected. Eleven specimens were done in April, twenty-one in May and seventeen in June. During the first half of this year there were 19 deaths from typhoid fever in Toronto, and this at the portion of the year least visited by this disease.

During last year fourteen per cent. of the samples examined showed these intestinal bacteria. The city authorities admitted the necessity of filtration of the city water and yet no move has been made to forward the movement. It is a pity that fifty one deaths from typhoid fever, a wholly preventable disease, should not have more effect on those authorities. These 51 deaths do not of course show the loss and suffering of the 500 cases of the disease that were amongst us last year. This condition is increasing from year to year.

There follows a table showing the number of specimens and their denomination from the various counties of Ontario, examined.

Report from Laboratory of Provincial Board of Health.

For Quarter Ending June 30th, 1905.

County.	Municipalities.	Diphtheretic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscell'ous Specimens.	Waters.		Total number for month.
		Release.		Diagnosis.							Chemical.	Bacterial.	
		+	−	+	−	+	−	+	−				
Algoma	3				1	2	1					5	9
Brant	5					3	6						9
Bruce	10			1	1	4	13			3			22
Carleton	5	6		1	2		3						12
Dufferin	1					1							1
Elgin	3											21	21
Essex	12				2	6	15						23
Frontenac	13	9	25	6	19	13	45	4	11	9		5	146
Grey	25			3	1	5	21	2	2				34
Haldimand	9					5	4		1	5			15
Haliburton													
Halton	3			1			2			1			4
Hastings	18		2	1	5	10	14		3				35
Huron	7			1	1		1		6				9
Kent	13					8	13	2	3			1	27
Lambton	19			2	1	5	16		1	1		3	29
Lanark	9			1	2	4	4			1			12
Leeds and Grenville	18	3	2	6	6	8	10	2	11			2	50
Lennox and Addington	15	1		9	1	1	16		1	1			30
Lincoln	11				3	7	9		1				20
Middlesex	5		1	1			2					12	16
Muskoka	8	2			1	4	9		1				17
Nipissing	7			1		5	6		1				13
Norfolk	10					4	10		1	1			16
Northumberland and Durham	23	5	6	6	10	5	10	2	2			4	50
Ontario	11					7	7	1	1			4	20
Oxford	15			1	1	6	17	1	10			2	35
Parry Sound	9				1	3	9	5	4			8	30
Peel	6			1	4		4					5	10
Perth	2			1			1						2
Peterboro'	5			1	3	4	7		1	6			22
Prescott and Russell	1									1			1
Prince Edward	2						2						2
Renfrew	15				3	5	5		2				15
Simcoe	21	1		1	1	5	15	1	12			5	40
Stormont, Dundas and Glengarry	13					7	12					3	22
Thunder Bay	2						1					5	6
Victoria	8			2	4		2		1				9
Waterloo	18	1	3	4	4	5	12					2	31
Welland	7				2	1	4		1			2	10
Wellington	21	7	5	5	11	3	17	1	4	1		12	65
Wentworth	9				4	2	3		4				14
York	25	19	18	21	50	22	46	13	38	6		55	287
Rainy River	1					1	1						2
Totals	....	54	62	76	142	170	390	34	123	36	......	156	1,243

Medical Inspector's Reports.

By R. W. BELL, M.D.

PRESENTED AT AUG. MEETING OF THE BOARD.

Mining Camps Cobalt.

To the Chairman and Members of the Provincial Board of Health of Ontario.

Gentlemen,— On march 6th I visited the Mining Camps at Cobalt in the Temiskaming District. As these have only been in existence a few months and permanency uncertain, the buildings and accommodation were not found quite up to the requirements of the Public Health Act. The prospects now having improved very much and more buildings being erected, I arranged with the Managers to provide more and less crowded accommodation for their employees. With the exception of crowding the health provisions were satisfactory. Four Camps are in the immediate neighbourhood, two employing about 30 men and the others 8 to 10 each with a likelihood of

All of which is respectfully submitted.

R. W. BELL,
Medical Inspector,
Provincial Board of Health.

April 3rd, 1905.

Outbreak Diphtheria, Tp. East Whitby.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Owing to an outbreak of diphtheria in Cedardale, Township of East Whitby, and adjoining the town of Oshawa, and reported negligence on the part of the municipal authorities, I visited the place on March 11th last.

I found a most deplorable state of affairs in the house of Rich. Harris, a laborer. His wife and two children, aged 12 and 8 years, were confined to bed with diphtheria. One boy aged six years had died two days previously after four days' illness. Four more younger children were in the house, as also the father and two boarders. The father had only worked two days in two weeks, and had been looking after the household duties, cooking, caring for the children and nursing the sick. The boarders, two men, forced out of their employment, were quarantined with the family. All neighbours were afraid to go near the place, and the house was in a filthy condition. Dr. Belt, who reported the cases, had brought them to the notice of several kindly disposed ladies in Oshawa, who had sent in provisions, and having raised money, had the evening before my visit, secured a nurse from Toronto, who was trying to get the place cleaned up and patients made more comfortable.

I drove out and saw the Reeve, who is Chairman of the Board of Health. He showed no inclination to assist these poor people, nor to take the necessary steps to prevent a spread of the disease, but rather gloried in the township escaping the expense by the Oshawa ladies' help.

He knew all about the cases, as there had been a meeting the previous day of the Board of Health, attended by himself, the clerk and one other member, and they had decided not to appoint a Medical Health Officer, as someone from Oshawa would attend them, for self protection, and East Whitby did not need to, nor have to appoint one.

The last named member of the Board was anxious to do everything necessary to suppress the disease, and had sent a short telephone message about it a few days before, to your Secretary, and the other members refused to sanction payment of it.

I cannot speak too strongly of the utter disregard shewn by Reeve Cooper for the requirements of the Public Health Act, and the indifference to the welfare of a ratepayer of the township in affliction and distress.

I served on him a notice from the Secretary of the Provincial Board of Health, requiring the appointment of a Medical H. Officer forthwith. Even that he talked of setting at defiance, but three days later notice was received of the appointment of Dr. Hoig as M. H. O.

The main object of the neglect or refusal to act in this case, appeared to be to save expense to the municipality, which is one of the oldest and wealthiest in the Province.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

Toronto, April 3rd, 1905.

Smallpox at Blanche River.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—A complaint having reached this office that there were many cases of smallpox not properly quarantined, and not receiving necessary medical attendance and medicine, besides being improperly housed at Blanche River, the present terminus of track laying on the Temiskaming and Northern Ontario Ry., I proceeded there on April 8th. This place I had visited on March 4th last, when there was only one case in the camp. Now I found seven: all well on to recovery, although one man was still in the pustular stage and suffering very severe pain in one ear. All were able to come outside the isolation building and anxious to get away.

The building was much too small for seven patients and a nurse, being only 18x15 feet and 8 feet high, with only four bunks in it. With that exception the complaints were entirely unfounded. A good quarantine was kept on the building, for while the nurse and patients were out doors daily, they did not mingle with the camp.

All food was taken from the kitchen and emptied into dishes outside the hospital and no interchange of vessels. The door had been reported as the only means of ventilation, while I found two windows 2½x3 feet which could be opened; the doctor, whose headquarters is at this camp, was away up the line several miles, but the patients themselves said he visited them whenever he was in camp, probably twice a week and they got all medicine required and not "tangle-foot" whiskey only, as had been reported. They had no complaints whatever to make, except at being quarantined.

The report about decaying vegetables in the sleeping camps, causing an unbearable stench was grossly exaggerated. There was nothing of the kind during my visit in March, but I now learned that some bags of turnips had spoiled and were immediately thrown out on this being discovered.

I arranged with the Contractor's representative to have increased hospital accommodation immediately supplied, and all refuse about the camp burned.

I learned that after my last visit a large number of vaccine points had been obtained and freely used. As all the patients here had come from many miles up the line, I gave orders that no more were to be brought down, but must be quarantined where found or at the various headquarters of the physicians up the line and hospital accommodation be provided in readiness for future cases. These instructions were also given to the contractors and chief physician at New Liskeard, and notice also given that all cases must be reported.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector Provincial Board of Health.

Toronto, April 14th, 1905.

Smallpox in Rayside Township.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—Having been requested by your Secretary to investigate a report in regard to the prevalence of smallpox in the Township of Rayside, I reached there on April 6th, accompanied by Police Magistrate Brodie from Sudbury.

On making enquiries in the neighbourhood of Azilda, we concluded there had been many cases of a mild type in the township during the past winter, but rarely, if ever, a physician employed. The people give information with much reluctance.

There are only three school sections in the township, but in one of these we were informed that the teacher and scholars all had smallpox at the same time; but of such a mild type that the school was never closed. This I could not verify, as the teacher had removed to another part of the Dominion.

We visited one house where there had recently been eight cases, the mother and seven children. All were recovered, but the mother still showed marks resulting from it. Here the children had been kept from school.

It was, however, evident that but few precautions had been taken to prevent the spread of the disease in the township, and no disinfecting whatever resorted to. As there had been no Medical Health Officer appointed, I interviewed the Reeve, and insisted on one being appointed at once, who should make a house to house visitation and find out where the infection had been, disinfect houses and clothing and vaccinate all unvaccinated persons. He promised to call a meeting of the Council within forty-eight hours and have the matter attended to. This he did, and has reported that Dr. Gagne of Chelmsford had been appointed M. H. O. to look after the necessary work.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

Toronto, April 31st, 1905

Smallpox in Pembroke and Township Westmeath.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—Smallpox of a severe and fatal type having been reported from the Town of Pembroke and Township of Westmeath in Renfrew Co., I proceeded there on April 20th to confer with the health authorities.

It had been first recognized in the family of one Sullivan, who had a fruit and confectionery store, living over it, in the business part of the town, on the 9th of April and followed by Mrs. Sullivan's death next day. No less than ten occupants of this house had the disease, and all were quarantined over the store, which was closed. Another store owned by Sullivan in the eastern part of the town, and attended to by a girl who slept at Sullivan's, was also closed, and the girl quarantined at her mother's. Neither store had to the present time been disinfected, nor had any exposed person been vaccinated. It was supposed the disease had been brought from a lumber camp by a brother of Mrs. Sullivan, who came there with a rash on him some weeks before, and slept with a brother who lived at Sullivan's, or from another brother and companion who came from a different camp with some skin disease, and for whom Mrs. Munro, Mrs. Sullivan's mother, washed clothing and then visited her daughter's. In any event, the disease also attacked the Munro family in the country, and proved fatal in one case, which current report called "Black Measles," and which was registered as "Measles" after death.

With Dr. Sparling, M.H.O., I visited a family named Gilbert on the east side of the river and found there undoubted smallpox in four children and house quarantined, but not placarded, and there had been a similar case in the adjoining house. These cases did not seem to have any connection with the Sullivan cases, and I could not trace them to their origin.

In the evening I met with the Local Board of Health, and arranged with them to remove the infected persons from the thickly populated portion of the town to the exhibition grounds, and there have them cared for under canvas until well, and the infected houses and contents thoroughly disinfected, or destroyed when necessary. Vaccination to be carried out vigorously in the schools, and the authorities thoroughly aroused to the necessity for stamping out the disease.

Next day I visited Cobden and the Township of Westmeath. At the former place I found Dr. Mair, M.H.O., alert, and with three persons quarantined who had been exposed with the Sullivan's. Dr. McLaren, M.H.O., also had suspects quarantined in Tp. Bromley.

At Snake River, in Westmeath, Dr. Graham was taking active measures to prevent the spread of the disease, where it apparently has a foothold from Munroe, whose death was previously spoken of.

So far as I could learn, neither of the persons in whom the disease proved fatal, had ever been vaccinated. These cases of a hemorrhagic type go to prove that although the epidemic may be of a mild character in most cases, out of the original modified cases severe cases of the worst type may develop in those unprotected by vaccination.

All of which is respectfully submitted.

R. W. BELL,
Medical Inspector, Provincial Board of Health.

Toronto, April 28th, 1905.

Smallpox Investigations during May and June, 1905.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—During the months of May and June it has been necessary for me to visit several localities in connection with outbreaks of smallpox. In several of these cases and in others mentioned in previous reports, the disease had been mistaken for chickenpox, and it is marvellous the reluctance exhibited to taking the necessary vigorous measures to check and stamp out the trouble when once it is definitely recognized. Even medical men ofttimes shew more or less indifference, not wishing to admit their diagnosis had been wrong, although not always discreditable to them, owing to the great similarity between modified smallpox and chickenpox in appearance, and inexperience with the former disease, several medical men admitting these were the first smallpox cases they had seen. In some cases a physician has not been called at all to see the cases, but prescribes for "chickenpox" on the strength of statements by friends that a member of the family is so afflicted. In other cases I fear the correct disease is suspected, but called or allowed to be called "chickenpox" where placarding for smallpox might interfere with the business of the family or community, and possibly recoil on the practice of the attending physician who desires to do what is right, but dreads the result owing to unscrupulous actions of others who are less conscientious, and willing to mislead the public and take the risk owing to the mildness of the disease.

Fortunatey for the patients, but unfortunately to some extent for the general public, the disease has been as a rule of a very mild type, and almost ignored, while had it been of a severe type it would have been dealt with as it deserves and been stamped out. Almost daily I see more and more the necessity for having County or District Health Officers on respectable salaries, who can deal wih contagious diseases and the general health of their communities, without suffering pecuniary loss, through the displeasure of their patients, who may take offence at individual hardships requisite for the general good.

Lindsay. May 3rd I saw a young man who arrived the previous day by train from Victoria Road and who imagined he had chickenpox, but on consulting Dr. McAlpine, M.H.O., smallpox was at once recognized, and he was immediately placed in a pest house and the car quarantined. This was a well marked case and came from the Tp. of Digby. The car was thoroughly disinfected before being released for further use. The same evening I proceeded to Victoria Road and arranged with Dr. Grant for the quarantining and disinfecting of the hotel where this patient had slept, and also for similar precautions at this residence, etc., in Digby. I have since learned that the Digby authorities had a great deal of trouble with his relatives, who tore down placards and drove the constables away with clubs.

Again, on June 16th I was called to Lindsay, to confer with the Board of Health regarding an outbreak in the Benson House, the leading hotel of the town. The day before, Dr. McAlpine, M. H. O., had diagnosed smallpox on one of the dining-room girls on his first visit. The rash had been out two days, and consequently many persons exposed. The patient was at once removed to the pest house, and six other employees who had been most in contact with her, were quarantined in an isolation tent. This was also a well marked case, and was supposed to have become infected from her sister, who visited her two weeks previously from Fenelon Falls, and remained two nights in Lindsay and at that time developed a rash, other members of the family having previously had it. The dining-room, kitchen, and domestic sleeping apartments of the hotel, had been closed and disinfected, and no guests taken for two days. As one of the quarantined girls who had been in contact with the patient was a chamber maid, and had visited one of the flats in the front portion of the hotel, I arranged for a thorough disinfection of the whole premises before reopening for business again. The promptness with which the Lindsay authorities act is most commendable. ,

The following day I visited Fenelon Falls, and was informed many cases of chickenpox had existed there. I saw the two little sisters of the Lindsay patient from whom it was supposed her case originated and from the marks still visible, I have no doubt about the nature of their disease. I met the M. H. O. and Board of Health and arranged for the necessary precautions to be taken to prevent further spread.

Township of Downie. Dr. Sheard, M. H. O. Toronto, having informed us of a case of smallpox in the city, the patient having come from Avonton, in the County of Perth, where he said chickenpox was prevalent, it was deemed expedient thatI should visit that locality and investigate.

On May 5th I reached Stratford and enquired from the M. H. O. and others, but they had not heard of any infectious disease in the neighbourhood. I drove to Avonton and there found the family where the case which developed in Toronto had originated, thence to St. Paul, and traced up in this township, about ten cases, of undoubted smallpox in seven families. None of the patients had been seen by a doctor, except one in the early stage some months before, and too soon to recognize the disease. Several of these patients had got medicine from doctors in St. Marys who were consulted by other members of the family, who reported to them that they had chickenpox.

Besides the patient who brought the disease to Toronto, two others had gone to Hamilton, and I fear were the means of carrying the pest there. Another patient had also gone to the Western states before completely well, but I could not trace him. At the time of my visit a patient not nearly free from the rash was in St. Marys for the day.

Next day I sought Dr. Nichol of Sebringville, M. H. O. of Downie, and communicated to him my discoveries. No less than three school sections were in touch with the infected area, so that I arranged with him to vaccinate all children and exposed persons, and quarantine all necessary, until, thorough disinfection had been carried out. A few days afterwards Dr. Nichol reported seeing one well marked case, but vigorous measures being resorted to, there was no further spread of the disease.

A few days afterwards, on May 10th I was required to again visit St. Marys, to confer with the M. H. O. regarding the steps to be taken, because of a case which had just developed in Nissouri, in a man who had stayed two nights with his brother in a boarding house in St. Marys, after arrival from the Temiskaming District. All requisite precautions by quarantining, etc., were taken and nothing further developed.

Milberta. On May 16th a letter dated May 8th. and signed by 14 employees of the Rideau Lumber Co. from a river driver's camp six miles beyond Milberta, was received, making complaint that smallpox had broken out in their camp on April 6th, and so far, four cases had developed, proper quarantine had not been maintained, nor medical attendance given.

On the 18th I reached New Liskeard and there learned that at the time of the outbreak Dr. Young had seen the case and ordered quarantine and had one visit since, but the matter was in the hands of the Board of Health of township of Kerns who had provided a pest house at Milberta. Dr. Field had been appointed M. H. O. of Kerns the previous week and had been to the camp on Monday 15th inst. On 16th he had some blankets burned and some disinfected, men bathed and the camps broken up. Most of these men who had signed the letter I saw, and they all expressed their satisfaction at what had ultimately been done. The infected men being well, had been discharged at Milberta this morning, and the only complaint was, that the Board of Health had been rather slow in acting.

In New Liskeard there were some suspects in quarantine, which was not being as effectually enforced as it should have been, but measures were taken to have this rectified at once.

Sault Ste. Marie. On May 20th I reached the "Soo" where I found two cases of smallpox and one suspect, in isolation camps, outside the town. Both of thesecases had come across from the American Soo, although possibly one of them had originated on the Canadian side shortly before, as he came from Spanish, which was placed under quarantine as a precautionary measure. The Soo has been rather unfortunate, owing to its proximity to the United States, in having to care for cases of infectious diseases coming into Canada at this point, there being no quarantine officers maintained by the Dominion Government to prevent such entries, while on the American side, the closest watch is kept to prevent these cases being sent back or others entering there from Canada. The Soo is put to considerable expense in caring for these unfortunates who do not belong to them, and while protecting themselves also protecting the Province from a spread of the disease. I think the Dominion authorities ought to be asked to maintain a constant quarantine officer here, as it is one of our great danger points.

Township of Rayside. Here I found on May 27th that instructions given to the Reeve and Chairman of the Board of Health, on April 6th last, *re* disinfecting of many infected houses in the municipality, had not been carried out. The Council had at first appointed as M. H. O. a physician who was not registered, and on being notified that he could not act, Dr. Dutrizac of Blezard Valley was appointed, but there the matter dropped. This township as I reported previously, had been overrun last winter with smallpox, and no cleaning up had been done. At the present time I found Dr. Shepherd of Chelmsford with cases on hand, he having recently settled here. I conferred with Dr. Dutrizac, who has also recently settled in the township, and he promised to make a thorough investigation at once, and see to the disinfecting of all houses where smallpox had been. I also visited the Reeve and Clerk of the township, and insisted on the M. H. O. being given all the assistance necessary.

Merlin, County of Kent. Reports of suspected cases having reached us from Merlin, I visited the village on June 27th, and found a family named Livingston who had arrived on May 13th from Ireland via S. S. Lake Champlain. They were visiting relatives named Mason. Enquiries elicited the facts that the Livingston children a few days after arrival developed a rash which was called chickenpox. About the end of the month Mr. Mason's daughter and son, adults, contracted the disease, and both of them now shew well marked signs of having had smallpox, one of them having a good many pits after a heavy rash on the face. Another family of Masons two miles out in East Tilbury township, where the Livingston children had visited, also developed the disease, and at the time of my visit were just recovering from it. With Dr. Oliver I saw these cases, and he undertook to at once have patients bathed, houses disinfected and every precaution taken to prevent further spread of the disease.

There is reason to suspect this disease came from the ship, the papers from which sent to your Board of Health stated there had been smallpox on board, and then "small" ruled out and "chicken" written over it, on several sheets, and that one case of chickenpox had been landed at quarantine. Mrs. Livingston also told me that while a child was said to have been left at the quarantine station with chickenpox, the mother was left there because she had not been vaccinated. I think further enquiry should be made into this case, as I fear there has been laxity in allowing something more than chickenpox to escape from the ship, and it is difficult to say how many centres of infection may result from it.

I believe there have been several other points in the Province from which smallpox has been reported to your Secretary, and so far as necessary dealt with by correspondence, but the above constitute all I have had to deal with personally. With the exception of the cases previously reported from Pembroke, which ended fatally, all have been of a modified type and required but little medical attendance.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

Toronto, June 30th, 1905.

Helen Mine Camps.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—On May the 24th I visited the property of the Algoma Commercial Co. known as the Helen Iron Mine, near Michipicoten, on Lake Superior, and here I found the sanitary conditions very satisfactory.

Several large frame buildings for sleeping camps are situated high above the works, 700 feet above the lake. Each building has a large central sitting room with bedrooms around it, while the upper story is divided into rooms about 12x14 ft. with two beds in each for four men. All rooms lathed and plastered.

In an adjoining building are three large dining rooms, and kitchen with fine cooking ranges, and everything exceedingly clean and tidy. A splendid supply of water is obtained from a lake still higher up and beyond contamination, while there is perfect sewerage into a lake lower down, where the water is not used at all.

There is a good hospital building in charge of Dr. Proctor, who is in the employment of the Company and giving his whole time to this camp. He has only been out from the camp once in a year, and is well spoken of by those in residence. Only one patient was in hospital at the time of my visit, with a trifling cut above the eye.

Everything about the camp was as clean as can be expected about an iron mine, although I saw it at its worst, in a perfect downpour of rain.

Certainly the conditions here do not bear out the charges made of lack of consideration for the comfort of the men, either when well or during illness.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

Toronto, June 15th, 1905.

Sanitary Conditions of Espanola.

To the Chairman and Members of the Provincial Board of Health.

Gentlemen,—On May 26th I visited the works and premises of the Spanish River Pulp and Paper Co. at Espanola, soon to be operated.

Thirty-four brick cottages have been erected for the use of the employees, on the high ground to the south of the river and west of the mills.

A water supply is gathered from springs on the hill side, partly below the cottages and conducted into a well from which it is pumped to a tank high above the houses to be supplied. As there are no sewers, I feared the sewage would soak through the soil into the springs. I therefore advised with the manager of the works, Mr. W. J. Hickey, to have a new well placed further west and clear of any possibility of contamination from the cottages, as the trend of the hill is eastwards towards the river. This he foresaw the necessity of himself, and undertook to have it remedied at an early date. All other sanitary conditions were quite satisfactory.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

Toronto, June 16th, 1905.

Report on Water Supply and Sewers, Rainy River.

To the Chairman and Members of the Provincial Board of Health.

Gentlemen,—While visiting the town of Rainy River on Feb. 22nd last, and again on June 5th, I found the water (particularly at the latter date) so bad in the hotel where I was domiciled, that I deemed it wise to investigate the source of supply. It was little better than soakage from a manure pile, abominable for washing with, and certainly unfit for drinking or culinary purposes.

The town, which has a population of about 1,500, is situated on the north bank of Rainy River on a flat 10 or 15 feet above the water level, and has sprung into existence during the past four or five years, owing to the large lumber mills here situated and the crossing of the Canadian Northern Railway. It is likely to develop into a fair sized town. There is as yet no municipal water system, the citizens being supplied from wells and from the river. The wells mostly contain surface water, and I found that dysentery of a very severe and prolonged type was prevalent, probably due to impure water supply.

The C. N. Ry. has a four inch supply pipe from the river to their tank a distance of 600 or 700 yards up Fourth St. and then angling across their property to the tank opposite Second St. Three hotels, Drewery's grocery and liquor store, the Rat Portage Lumber Co's. general store, and at least one private residence have connection with this supply, and get their water directly from the river while the pump is going (three or four hours daily), or by gravitation from the elevated tank.

From the railway there runs a 12-inch cemented tile sewer to carry off overflow, and wash water from the engines, etc., to the river, emptying about 20 feet below the intake pipe, almost in dead water about 20 feet from shore. The hotels and others have connections from their sinks and closets with this sewer, thus contaminating the supply close to the intake. At Second St. about 200 yards up stream is the outlet of a slough, into which closets are emptied by box drains, and there is soakage from others, especially from the school closets on east side of the street. The railway people are not supposed to drink this water, as I was informed that on the engines a keg was carried for obtaining a pure supply from Mine Centre and other points where there are good springs, but there is very little doubt that more or less of this water is used, and drinking tanks in the cars are filled here if empty, and also supplied with ice taken from the river between

First and Second Streets. This I have on the authority of local railway employees.

In conversation with several citizens, I urged the abolition of the present supply for domestic use, and the installation of a municipal system which would not be expensive, as no rock cutting is required, and to get a supply above First St., or better still above the R. R. Lumber Co's. Mills, but there is opposition to this by the largest users, the hotels, etc., on score of expense, as they are getting cheap water now. Sewers could be put in very cheaply as only soft digging would have to be done.

In the meantime I urged on the Mayor and the M. H. O. that immediate action be taken to improve the supply, by having the tank cleaned out, and sewer outlet turned some distance down stream, and until such was done that Board of Health should stop its use. If this has not been done, I certainly advise the Provincial Board to prohibit its use for domestic purposes and for drinking on the railway trains.

If the use of present supply is prohibited I have no doubt the citizens will soon make provision for a proper supply, as since making my notes I have been informed that Mr. Ruttan, C. E., of Winnipeg, had been in Rainy River two or three days previous to my last visit making an estimate of the cost of a water works and sewerage system.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

Toronto, June 17th, 1905.

Slaughter House—Macaulay Township.

To the Chairman and Members of the Provincial Board of Health of Ontario:

Gentlemen,—Application having been made to your Board in accordance with section 73 of the Ontario Public Health Act, on behalf of the Township of Macaulay, to investigate and report upon a slaughter house in said township, I proceeded to Bracebridge by the request of your Secretary on 21st June.

The slaughter house complained of is situated a few yards outside of the town of Bracebridge, and is used by S. H. Armstrong, who makes use of it two or three times a week during the year, except in winter. It is on a three cornered lot, with travelled roads on two sides, one of them much used, being a leading road into town. The lot is of such a size that it is impossible to comply with the requirements of the Act, Schedule B, section 8, and get at least 70 yards from a highway and 200 yards from a dwelling. As now placed, the house is about 25 yards from the boundary road between Monck and Macaulay, and about 100 yards from the leading Muskoka road into Bracebridge, while there are three dwellings within 150 yards. One of these families makes no complaint whatever as to the slaughter house being a nuisance, but this one is well sheltered amongst trees and to the west, the other two being more exposed and to the east, while westerly winds prevail, suffer most. They complain bitterly of the offensive odor, and say it is impossible to leave the doors or windows open in warm weather, that raw offal is thrown out to the hogs, and decomposes in the sun, also blood is run out to the hogs; that frequently bones and decomposing offal is burned causing terribly disagreeable smells; also that the animals are frequently killed by shooting while running about the lot, which is dangerous, and the moans of the dying animals is heartrending.

Some of these statements are denied by Armstrong, who declares that all blood and offal is boiled before being fed to hogs, and all bones burned, but even this is offensive. Enquiries about Bracebridge from various citizens goes to show that the place is considered a nuisance by many people, who have to drive past, and whose horses sniff the decomposing blood and take alarm.

On visiting the place on the evening of the 21st inst., I found evidences of recent clearing up and the place had shortly before been flushed out, while the immediate yard to the rear was as clean as could be expected. Inside the slaughter house were a couple dozen hides which created rather a bad smell. Outside was a box with three beef and sheep heads decomposing and smelling badly. In a gully close by, through which a small stream flows, were about 25 to 30 hogs wallowing in the mire.

I again visited the place about 11 a. m. on the 23rd inst., and found the stench very offensive, as several more heads had been added to those previously seen and were literally covered with flies in the hot sun, while in the adjoining yard was a head being devoured by the hogs as also a trough nearly full of blood.

Water for the slaughter house has to be carried up in pails from the streamlet at the foot of the hill, and therefore it does not get the thorough cleansing which such a place should get. With the number of hogs on the premises I cannot see that the place can be anything else but offensive and prejudicial to the health of those living nearest to it, but Mr. Armstrong has a certificate from four parties living a little further away saying they do not consider it a nuisance. I might add that the creek in which the hogs are wallowing runs through some fields a little further down, where, I am informed, milch cows are pasturing and drinking this polluted water.

Mr. Armtrong says he was granted permission by the municipal authorities to erect a slaughter house on this lot, but admits this was withdrawn before the building was erected. The township authorities say nothing more than verbal permission was given, conditional upon complying with the Public Health Act, but finding the lot not large enough to comply with the Act, a formal resolution was passed and served on him forbidding it. This was in 1903, but he went on and was fined in 1904 for maintaining a nuisance, and still refuses to abate it.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

Toronto, June 24th, 1905.

Inspection of Port Stanley Wells.

To the Chairman and Members of the Provincial Board of Health.

Gentlemen,—Owing to complaints from the Health authorities in London, about the condition of the water supply in Port Stanley last season, and to the contamination of which they attributed the large number of cases of Typhoid Fever which developed, it was deemed expedient that samples of water from the various sources should be obtained for examination, before the tourist season opened, as this place is visited weekly by many hundreds of people during that period.

On May 9th, therefore, I proceeded there and collected samples from nine different wells, but from several others I could not get them, as they were not in use, and pipes were disconnected, the tourist and picnic season not having yet commenced.

The well supposed to have been the worst last year, at west end of Fraser House, had been filled and abandoned. The cement tank at east end, and filled from the well down on the beach was empty, and pipes disconnected, neither was water obtainable from this lower well, as covered and pump out of repair. The hotel, which is at present occupied only by the permanent residents, is supplied from a well near the stables, which is a covered spring in the hillside, dug out about 12 or 15 feet deep, and bricked up, but bricks were loose and much surface water in it. The owner stated his intention of cleaning it out, and having it thoroughly repaired with cement, etc., within two or three weeks. A sample of the water, however, was taken.

At Erie Rest, I took a sample from Mrs. Abraham's well, where I found the water running from a pipe in the hillside, and through a sunken box. The earth around it was stained, as if from iron rust. Across the road to the north, I got a sample from Stuart's well, also on the hillside, but which is dug out, over a spring, and curbed for several feet in depth.

In an adjoining lot to the west (Mitchell's), no water was obtained as the well was not at present in use, the pipes disconnected and no pump. The board covering over this well was in bad condition, the water stagnant, and some dead dog or sheep could be seen in it. This well, I understand, has been much used in past years.

From wells on the streets, situated near Bell's cafe, the Franklin House, Russell House and Taylor's boarding house, I took samples as all much used. The Russell House well, I was informed, had been thoroughly cleaned and rebuilt since last fall, and Dr. Mothersill, M.H.O., told me the council had arranged to abandon and fill up those at Bell's cafe and the Franklin House.

At the Loney House are two wells; the one to the south only, being in present use, and from it I took a sample. The other is a driven well about 20 feet deep in the north yard, and is much used in summer, but I could not get water from it as the pump was broken, and it had not been in use for several months, but was to be repaired immediately.

High up on Hill Crest is an elevated tank, to supply the cottages there and in the vicinity. This is filled by pumping from the ravine close by, where are a couple of tanks or small reservoirs, into which water is piped from springs on the hillside. Here the pipes were also disconnected, and the tank empty, while the water in the reservoirs was stagnant, and not in use, but all was to be put in good order before summer residents arrived.

From "Stanton's well," 19 feet deep, in his garden, a short distance from the foot of the hill, near Orchard Beach, I took a sample, as it is also much used. I fear contamination of this well as it is too near the sewage from the house, and drainage is rather towards than from it.

It will be noted that my visit was at too early a date, as several wells much used in the tourist season were not now in use, and had not been for months. The others were filled with surface water. As all, except the one on the beach, are either spring or seepage, I fear their contamination from the pit closets and sewage.

Supplementary Report. On June 28th I again visited Port Stanley, and obtained samples of water from some of the same wells examined before, and from the others now in use, while I found two abandoned and filled up, the others had been cleaned and repaired. The well on the beach below the Fraser House, and which is supplied by Lake Erie water filtering through the sand, was being cleaned out at the time of my visit by the P. M. Ry. employees. Mr. Le Seur, their Engineer, told me it was to be curbed with brick, and cemented inside and on top, as soon as cleaned, and put into the best possible condition. From this source the cement tank (which has been thoroughly cleaned), at west end of the dancing pavillion on Fraser Heights, will be supplied, and from it the Fraser House.

At Sprinkbank (Stuart's), Mrs. Abraham's, the Russell House and Loney's south well, I found little change from my last visit, except that the surface surroundings were cleaner, and neighbouring refuse had been removed.

At Mitchell's well the covering was still in bad repair, and very open. I was informed by neighbours, that it had been cleaned out recently, and I found an iron pipe connected, which led into a trough a few yards distant, for the cattle pasturing, but water not readily obtained by visitors.

At Hill Crest, the storage tanks had been cleaned, and connection made with the elevated tank, which was soon to be replaced by a new and larger one, which was on the ground ready for the change.

The Loney house driven well was also in use, and surroundings clean. From these last three, which were not in use at the time of my previous visit, I took samples. At the Fraser House, the well near the stables had been cleaned out, re-bricked and cemented, all re-covered, and the house over it closed and locked. A pump in the stable yard draws water from this well, and it is much used by visitors, and is at present being used in the hotel, until the "railway beach well" is in operation.

The wells on the street at Bell's cafe and the Franklin House have been abandoned and filled up since my last visit on May 9th, and the latter house is now supplied from a spring high up on the adjoining hillside, and water piped down into the house.

A sample taken here, as well as all others, was collected strictly according to instructions, immediately packed in ice and sawdust, and shipped to Dr. Amyot, Provincial Analyst, for examination.

The local board of health with the M. H. O. apparently are acting energetically and doing all possible to see that good water is obtainable.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

June 29th, 1905.

Sanitary Conditions of Jackson's Point.

To the Chairman and Members, Provincial Board of Health:

Gentlemen,—On July 8th inst., I visited Jacksons Point, which is quite a popular summer resort on the south shore of Lake Simcoe, and inspected the sanitary conditions of the larger boarding houses.

The "Lakeview House," H. W. Saunders, proprietor, consists of three large 3-story frame cottages with accommodation for about 150 guests, and is situated about 200 yards back from the lake in handsome grounds, a much travelled road passing in front, and a small park intervening between it and the lake. The buildings are probably 20 feet above the lake level, one facing the lake and to the north, the other two being to the west front and facing east. The water supply is taken from 300 feet out in the lake, and pumped up by an engine near the shore, into two elevated tanks, one in the park and the other east of the Main Cottage.

These supply the cottages by gravitation for all purposes, and ice is used in the drinking water. There is a well to the east of the main cottage, but it is not much used in summer.

There is a water closet on the 1st floor in each building, and two large 3-seated ones in rear of the western cottages, all new and only in use two weeks.' So called septic tanks are close outside each of these closets, with drain tile across the side lawn one foot down. The tanks are 4 by 8 ft. and 4 feet deep, two compartments and covered with planks and sods but as the proprietor informed me there was no bottom to them but the earth, they are only cess-pools. Until a bottom put in and cemented, I advised the free use of copperas. Kitchen garbage is fed to the hogs far back by the barns. All other surroundings are excellent.

"*Pine Plaza.*" I. A. Lake, Proprietor. This is a large frame building facing south with many trees about it, and a small lawn to the east, between it and the lake about 100 yards distant, and has accommodation for from 100 to 150 guests. The water supply is here pumped by a windmill from 200 feet out in the lake to an elevated tank at west end of house, and holding about 600 gals., thence piped by gravitation to different parts of the house and used for all purposes. A well about 20 feet deep, close to the back of the house was full at the time of my visit, but it is said not to be used, unless for washing vegetables, etc.

There are water closets on the 1st floor, flushing well, and have been in use 3 years. A septic tank is close to the back of the house, well cemented. 3 compartments and 5 feet deep. The tile are in three rows one foot under the lawn, to the east of the house. The tank is cleaned out each Spring. Kitchen slop is caught in pails and emptied into the septic tank. All garbage is carted away daily to hogs not on the premises. There is an outside pit closet, which can be used in case of necessity, but it is rarely used and is kept well limed. All other surroundings good.

"*Glen Sibbald.*" Jos. McNeil, proprietor. Here are two, 2 story frame cottages with lawn in front and road close to the lake with steep bank of 10 feet to a stony beach. Accommodation for 50 guests. The water supply is from 400 feet out in the lake, and pumped by a windmill to an elevated tank, but not used for drinking as no ice supply. A creek, always running, from the south, passes close behind and to the west, emptying into the lake as a small streamlet. This stream passes through a swale 10 to 20 yards wide with high grass and weeds, and this extends behind the main cottage and a few yards east of it. On the northerly side of this swale, and a few yards from the kitchen, is a well 20 feet deep, said to have good water in it, but it is 10 feet deeper than the swale into which the kitchen slop water runs, and also the soakage from the barns 150 feet to the south east, with decided slope to the swale. Pit closets are on a high bank draining into the swale, west of the main and south of the smaller cottage, distant 20 yards, and thence discharging into the lake, a hundred yards away. I fear contamination of this well which furnishes the drinking supply.

"*Springwood.*" Chas. Martin, proprietor. This resort consists of two 2-story buildings, one rough cast with large frame addition and the other all frame, with accommodation for 60 guests. The main building is about 30 yards from the road which runs quite close to the lake, and the barns about 120 yards south of the cottages. The water supply from the lake is pumped from 200 feet out, to an elevated tank in centre of front lawn, and thence to the cottages and barns. Drinking water is obtained from a well 13 feet deep, and with now 4 feet of water in it, about 40 feet in rear of the main cottage. The soil consists of 4 or 5 feet of sand with stiff clay below, which does not allow the lake water to filter through, nearby deep wells going dry. Box closets are situated outside between the rear portion of cottages, and are said to be emptied and contents buried at least every second day, but generally every day. Waste water from sink only, is run through sewer pipe to the garden, while all other wash water, etc., is carried out and poured on surface of ground. Garbage is fed to hogs at the barns. All other surroundings are in good condition.

At all the places described I would strongly recommend the adoption of properly constructed septic tanks, as they are admirably situated for their construction and at a minimum of expense.

The same might also be advised for the private cottages, as the soil being here of a sandy nature there is considerable risk of the wells being contaminated from the pit closets which are in general use.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

July 12,th 1905.

Sanitary Conditions of Grimsby Park.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—Grimsby Park, a popular summer resort, situated on the south side of Lake Ontario, was visited by me on July 15th and 16th with the object of looking into its sanitary condition, and the provision made for the health of the 800 to 900 residents there during July and August, together with the almost daily addition of several hundred picnic visitors. The park, consisting of about 100 acres with a fine sand and pebble beach, and high bank back of it, forming an ideal camping ground, is owned by a company which leases small plots of ground for the erection of cottages, manages the two hotels on the premises, furnishes entertainments, looks after the sanitary condition, and with rigid rules and regulations, administers the affairs through one of its Executive officers as Manager.

A considerable portion of the northern part of the park, particularly the grove adjoining the lake is laid out with narrow streets or avenues, and along these, cottages to the number of nearly 200 have been erected, about as close together as it is possible to build them, sides and backs frequently almost within arms length of each other, rendering a community system of closets necessary, at inconveniently long distances away (for sanitary reasons), so long as a general sewerage system is not in vogue, and also much inconvenience in the disposal of kitchen and bedroom slop.

A number of springs in the grounds furnish a good supply of drinking water. Near the north central and most densely populated portion of the park, a pier or wharf extends about 100 yards into deep water. At the inner end of this pier is an engine house, from which is supplied electric light and water for the whole community, the latter being drawn from about 200 feet out in the lake on the west side of the pier, and pumped to 3 elevated tanks from which are connections to all the cottages. This water is used for all domestic purposes except drinking, and probably also for drinking by many who have an ice supply.

There is, however, great danger of contamination, as the outlet of a sewer from the "Lakeview House" into which the vault of their closets and another one from the rear are flushed, is only a few feet out into the lake about a 100 yards west. With a westerly or north westerly wind blowing, this sewage would be retained right in the vicinity of the intake pipe. I was informed by the Secretary and Manager of the Park Co. that this sewer was only flushed when the wind was blowing steadily off shore.

During my visit an evident flushing took place, and the wind veering around to the north west, the odor in the evening on the balcony of the hotel was very unpleasant, and down about the outlet of the sewer it was unbearable. The pipe was also leaking and sewage was running down the bank and over the sand on the beach a few yards below the hotel. Another short sewer or drain from the "Park Hotel" discharges into the lake a short distance east of the pier. This is primarily for the kitchen and has no privy connection, but I understand a receptacle into which the bedroom slop of the hotel and a number of cottages is thrown, is connected with it. Private closets for the cottages are not permitted, except about a half dozen where modern patent odorless pail ones are used and frequently emptied by the garbage man. To get over the necessity for sewers, a number of compartment privies are erected over large stone and cement vaults, at considerable distances from the cottages, for general use, large quantities of disinfectants being used in them, and these are said to be emptied late each fall or after the contents are frozen. The vaults at the "Lakeview House" and one a short distance in rear of it, I am told are the only ones flushed and sewered to the lake. Further south and in the neighbourhood of the picnic grounds are two pit closets without cemented vaults, which are reported as cleaned yearly, the pits being filled and new ones dug further on every two years. Bedroom slops are not emptied into any of the privy pits, from the cottages, but carried to separate receptacles.

Disinfectants are used freely everywhere. All kitchen garbage is collected daily, and carted away from the park, and notwithstanding the congested condition of the residential portion, everything seems in excellent order, and every effort appears to be made with the system in vogue to keep it so, but a change to the septic tank system for the disposal of the sewage is much to be desired, and will add greatly to the sanitary condition of the Park.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector,
Provincial Board of Health.

July 17th, 1905.

Port Stanley Water Supply.

By Drs. HODGETTS AND AMYOT.

We beg to report as follows on the water supply of this village—the population of which is 600, with an assessable value of $160,000.

The village must be considered from two standpoints, viz.,—the permanent residential district, and that occupied solely by summer residents.

The former is situated on the lower lying ground on the banks of Kettle Creek, which divides the village, and the latter on the bluffs lying to the east and west.

The present water supply is that derived from wells or springs, many of which are to be found scattered over an area stretching from east to west for nearly a mile and a half.

An analysis of the samples taken shortly after our inspection is herewith submitted, from which it will be seen that nearly all show evidence of bacterial infection, and many show a marked excess of chlorine.

After a careful examination we are of the opinion that owing to the possibility which must ever exist of pollution taking place from cesspool, stable and sub-surface washings of the water of the wells and springs now in use, their use must be prohibited, and there must be substituted some public system.

It appears to us that the supply of good water could be obtained by either sinking a well or by driven pipes on the sandy beach west of the park and slightly to the east of the Junction Railway. The water being pumped to a concrete reservoir on the ridge to the west of the village—the village service being by underground pipes—and some cheaper system whereby pipes laid on or slightly below the surface of the ground, would supply the cottages at Erie Rest on the west, and those in the extreme east end.

This system presents, we believe, no engineering difficulties, and we would recommend that the Municipal Council at once secure the services of a competent engineer to prepare plans along the lines just suggested, or some other that may appear more feasible.

In the meantime the local Board of Health should by public notices, order the boiling of all water used for drinking purposes.

LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, May 23, '05.

Report on waters, collected by Dr. Bell, Med. Inspector, at Port Stanley and received by us on May 10, 1905. Analyses were begun on same day.

Laboratory numbers.	Sender's numbers.	Where collected from.	Streptococci	Staphylococci.	Colon bacilli.	Colonoid bacilli.	Chlorine in parts per million.
1302	24	Bell's Cafe	None.	None.	None.	Present.	22
1303	x18	Spring at "Erie Rest." Mr. Abraham	None.	None.	None.	None.	5
1304	39	Loney's south well	None.	None.	Present.	None.	66
1305	52	Springbank Cottage, "Erie Rest"	None.	None.	None.	None.	2
1306	x10	Taylor's well	None.	None.	None.	None.	24
1307	x39	N.E. of Fraser House stables	None.	None.	None.	None.	54
1308	x4	Wm. Stanton's, Orchard Beach	None.	None.	None.	None.	284
1309	3	Franklin House	None.	None.	None.	None.	65
1310	x2	Russell House	None.	None.	None.	None.	22

No. 1305 is from a surface source and should be regarded with suspicion. All the others showing chlorine above 8 per million are chemically polluted. 1302 and 1304 are in addition already infected with intestinal bacteria. The chemically polluted ones not already infected should be regarded with suspicion, for they are ripe for infection if it should come their way, and that is likely.

JOHN A. AMYOT.

LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, July 6th, 1905.

Report on waters received from Port Stanley, sent by Dr. Bell, Prov. Med. Inspector, on June 30, 1905. Analyses were begun on same day.

Laboratory numbers.	Sender's numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon bacilli.	Colonoid Bacilli.	Clorine in parts per Million.
1789	x44	Well, Springbank.........	None.	None.	Present.	None.	3
1790	15	Well, Mrs Graham.......	Present.	None.	None.	None.	4
1791	x11	Well, Mitchell's...........	None.	None.	Present.	None.	2
1792	3	Well, Fraser House stable.	None.	Present.	Present.	None.	85
1793	56	Hill Crest Tank...........	None.	None.	Present.	None.	8
1794	x42	Stanton'e well...........	None.	None.	Present.	None.	287
1795	x20	Russell House well........	None.	None.	Present.	None.	31
1796	x33	Lorry's yard well.........	None.	None.	None.	None.	44
1797	x46	Lorry's South well........	Present.	None.	None.	Present.	64
1798	x39	Franklin House well......	None.	None.	None.	Present.	6

Nos. 1792, 1794, 1795, 1796 and 1797 show marked chemical pollution. No. 1796, though showing chemical pollution, is not yet infected.

All the other chemically polluted ones are at the same time infected with dangerous bacteria. These waters are potentially dangerous.

Nos. 1789, 1791, 1793 show colon bacteria and should be regarded with suspicion.

No. 1790 shows suspected organisms as also does 1798.

JOHN A. AMYOT.

LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, July 27, 1905.

Report on waters received from Dr. Mothersill, M.H.O., Port Stanley, on July 18th and 20th, 1905. Analyses were begun on same days.

Laboratory numbers.	Sender's numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon bacilli.	Colonoid bacilli.	Chlorine in parts per million.	Remarks.
1988	2	Pretoria Cottage	None.	None.	None.	Present.	6	Suspicious.
1989	6	Tank, Fraser Grounds	None.	None.	None.	Present.	7	Suspicious.
1990	3	Hazel Brae Bar on Lake bank	None.	None.	None.	Present.	2	Suspicious.
1991	1	Spring Bank Cottage	None.	None.	Present.	None.	3	Dangerous.
1992	0	Mrs. Spitt at Drive well on beach	None.	None.	None.	Present.	12	Chemically polluted and suspicious bacterially.
1993	8	Mr. Price well	None.	None.	Present.	None.	17	Dangerous both ways.
1994	7	Well on beach	None.	None.	None.	None.	7	O. K.
1995	4	A. E. Pavey well	None.	None.	None.	None.	30	Chemically polluted, doubtful.
1996	x42	Miss Hanson, closets close	None.	None.	Present.	None.	18	Dangerous both ways.
1997	No. 2	Mrs. Nolan	None.	None.	None.	None.	51	Chemically polluted, doubtful.
1998	5	Grove Cottage	None.	None.	Present.	None.	8	Dangerous.
1999	x0	Mrs. Abraham	None.	None.	None.	None.	2	O. K.
2020	..	Mrs. Jennings	None.	None.	None.	Present.	8	Suspicious.
2021	14	Hillcrest	None.	None.	None.	Present.	8	Suspicious.
2022	..	Mr. Glover	None.	None.	None.	None.	32	Chemically polluted, doubtful.
2023	21	Mrs. Taylor	None.	None.	None.	None.	28	Chemically polluted, doubtful.
2024	12	Swim hole	None.	None.	Present.	None.	18	Dangerous both ways.
2025	15	Dr. Mothersill	None.	None.	Present.	None.	26	Dangerous both ways.
2026	13	Mrs. Hunt's	None.	None.	Present.	None.	11	Dangerous.
2027	18	Bell's well	None.	None.	Present.	None.	267	Very dangerous both ways.
2028	11	Mrs. Brown J., spring	None.	None.	Present.	None.	2	Dangerous.
2029	17	Mr. Leighton	None.	None.	Present.	None.	104	Very dangerous both ways.
2030	16	Mr. Moore	None.	None.	None.	None.	19	Chemically polluted, doubtful.
2031	19	Mrs. Payne	None.	None.	Present.	None.	26	Dangerous both ways.

The standard for surface waters at Port Stanley is from 2 to 3 of chlorine to the million.

The standard for deep well waters at Port Stanley is from 7 to 8 of chlorine to the million.

Increases above these show chemical pollution in proportion to increase.

Colonoid bacilli are suspiciously intestinal in origin. Colon Bacilli are intestinal.

J. A. A.

Second Report of the Outbreak of Enteric Fever in London.

By Drs. HODGETTS AND AMYOT.

It will be remembered that a report on this subject was presented and adopted at the first quarterly meeting of the Board. Shortly thereafter a copy was forwarded to the municipal authorities of London and Port Stanley.

As certain statements have been made by some of the officials of London in the public press, we deem it proper and in the public interest to refer to some of these, particularly as the statements are, to say the least, a misrepresentation and distortion of the facts regarding which we have spoken truthfully and without reservation, and are the conclusions arrived at after careful and repeated examinations of both the water and sewerage systems of London and the well waters of Port Stanley, notwithstanding the insinuations to the contrary.

We wish to reiterate the conclusions arrived at in our previous report regarding the impurity of the Port Stanley waters, and the suspicion which rests upon them as being factors in the London outbreak of enteric fever, but at the same time we would repeat the statement that the London water supply was not free from grave suspicion as being the other and perhaps the more important factor, and we would add that our further investigations only strengthen us in those deductions as far as they relate to the London water supply.

We would point out that the gentlemen interviewed simply state that our report is erroneous, as if this mere expression of opinion by any or all of them was a contravention of the facts as stated in our report.

The statements of the Chairman of the Board of Health are, to say the least, very contradictory and misleading.

He seems to be particularly aggrieved that the report does not coincide with the deductions made by himself—(see Appendix "A")—wherein he argues that 107 cases of enteric fever reported between August 2nd and Sept. 29th were due to the drinking of the water of one of the wells at Port Stanley, viz., that of the Fraser House, and that too upon a given date, July 20th. He sets aside the fact that both the wells and one of the ponds of the London system on October 29th, 1904, showed the presence of bacteria of the same variety as were found in the wells at Fort Stanley—(see Appendix "H"),—and upon the presence of these bacteria he bases his conclusions, that the wells of Port Stanley were the only cause of the London outbreak. The doctor must remember that we arrive at our conclusions by reason of the bacterial infection of the water of both municipalities backed up, however, in the instance of the London waters by the existing bad condition of affairs as found at Springbank, and it is only proper to draw attention to the fact that at times the London water supply had the same kind of infection as was found in the well waters of Port Stanley; and the pollution is found at a point in the system which is more serious than if found at any other, namely, the wells from which the whole water supply is pumped.

The ignoring of this report showing the infection of the wells, (Appendix "H"), and basing all his arguments on the Laboratory Report of May 8th, 1905—(see Appendix "A") of this Report, makes it appear that the Chairman of the Board, while incidentally admitting the ideas advanced in our report, that there may be some ground for suspicion as to the London water supply, belittles what the report points out—and desires the public to think there is "no danger," and to gain his point ignores the Laboratory report Nov. 4th, 1904, and lays stress on that of May, 1905 (see Appendix "H." The Chairman is supported in his contentions and arguings by the worthy Mayor, who, dealing in platitudes, states the Report is erroneous, though in what manner he does not indicate, and holds up to derision the conclusions of those he is pleased to honor as specialists, though in the next paragraph advancing his personal claims for that distinction. As for ourseives we make no claims.

From the general tenor of the reported interviews, it seems that the usual course adopted is to question the laboratory reports in so far as they reflect upon the purity of their own water supply—yet accepting the reports of the same investigators as far as they relate to the wells of Port Stanley; and then to intimate that your officers are guilty of making statements in the report regarding their system, which are not the result of careful investigation. We would here state that the negligence of the London authorities in respect to the pollution of the River Thames by raw sewage is, in our opinion, deserving of the severest condemnation, for after the removal of coke from the contact beds the raw sewage has been run direct into the river and that portion immediately above the dam and close to the pumping station has been the receptacle for the accumulated sewage of the city. This condition has existed for nearly two years without any effort being made to replace the coke which was used to heat the city offices. The neglect to replace this coke and the pouring of the raw sewage into the River Thames in our opinion amounts to criminal negligence.

The authorities of London show but litte understanding of either the duties of your reporters or the functions of the Board in stating that the report makes no recommendations—none were made because it was not within our province—but it was the duty of the Local Authorities when defects were pointed out to investigate and to endeavor to remedy the same. As to how far this has been done our report of another visit to Springbank, made last month, will show. Of the truth of this visit we would refer the doubting ones to Dr. Hutchinson, M.H.O., who kindly accompanied us, and to whom we were personally known.

Upon this visit we were able to secure information which only confirmed our previous report.

As to their being a fifth "pond or pool" across the river, we found that a little below the dam and close to the end of the foot bridge there is a cistern or well, the existence of which had been denied over and over again by Dr. English. We would apoligize for designating it a pool. This well is sunken in the earth and receives the water collected by underground tiles distributed for nearly a quarter of a mile on that side of the River. The estimated daily flow is 300,000 gallons, and this gravitates to one of the ponds on the opposite side through an iron pipe laid either on or under the river bed. This is the supply to which we referred in the previous report, but owing to its being impossible to cross the bridge on the previous occasion, we mis-stated as being a "pool," in many instances it is worse than what we called it.

We were not able to inspect the pipe or the cut off which is situated on the proximal bank under the river level close to the lower well, so cannot state if leakage of river water at any time is possible.

Upon enquiry we found that the wells had not impervious bottoms, but the height of the water therein was influenced by the height of the water in the river, whether it was the height above or below the dam, could not be ascertained; the fact, however, only further confirms the conclusion arrived at regarding them, and this river influence may account for the presence of colon bacilli in them in October, 1904.

We found that the manner in which a portion of the surface water collected to the east of the pumping station in its passage to the river is conducted across the conduit which conveys the water from the eastern pond, is such that it is possible for admixture to take place of some of the former with the latter.

A closet was also in use above the east pond just referred to.

We would further point out that the protection of the ponds from the entrance of small animals is extremely defective.

In conclusion, we would note with pleasure that certain very objectionable closets referred to in our previous report have since been made more or less water tight, having been converted into dry earth closets from which the contents, we are informed, are shovelled out at intervals—also that the construction work on the retaining wall in the central long pond has been completed and teams now no longer drive into it.

LABORATORY OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, May 8, 1905.

Report on water received from Dr. Hutchinson of London on May 2nd, 1905. Analyses were begun on same day.

Laboratory numbers.	Sender's numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon bacilli.	Colonoid bacilli.	Chlorine in parts per million.
1188	x46	Pond 4, Spring bank	None.	None.	None.	None.	4
1189	x44	Pond 2, Spring bank	None.	None.	None.	None.	3
1190	39	Fulton Well, across river at Spring bank	None.	None.	None.	None.	1
1191	x31	Well 2, Spring bank	None.	None.	None.	None.	1
1192	x20	Pond 1, Spring bank	None.	None.	None.	None.	4
1193	23	Well 3, Spring bank	None.	None.	None.	None.	1
1194	15	Pond 3, Spring bank	None.	None.	None.	None.	3
1195	x34	Well 1, Spring bank	None.	None.	None.	None.	1
1196	x36	Reservoir, Spring bank....	None.	None.	None.	None.	1

The variations in the chlorine content would indicate a source not uniform for each of these waters or chemical pollution. The bacterial examination shows no infection in any of them.

JOHN A. AMYOT.

LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, Mar. 15th, '04.

Ices received Mar. 14, 1904, from Dr. Hutchinson, London.

Analyses of Waters from Dr. Hutchinson, London.

Colon B.	Streptococci.	Staphylococci.	No.	Free NH_3	Alb. NH_3	Ox. Cons.	Chlorine.	Nitrites and nitrates.	——
—	+	—	(1) 563	.045	.09	.16	1	......	Coal.
—	+	—	(2) 564	.035	.075	.26	1	......	S. end pond.
—	+	—	(3) 565	.045	.075	.35	1	......	Middle pond.
+	—	—	(4) 566	.045	.075	.8	1	......	N. end pond.

GEO. G. NASMITH.

LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, Feb. 23rd, '04.

Analyses of Waters from Dr. Hutchinson, London.

No.	Free NH_3	Alb. NH_3	Ox. Cons.	Chlorine.	Nitrites and nitrates.	——
(1) 387	.025	.015	....	1	....	....
(2) 386	.03	.015	....	1	....	....
(16) 391	.17	.04	....	1	....	....
(3) 392	.675	.611	....	1	....	....
(5) 393	.16	.65	....	1	....	Full of blue-green Algae and water fleas.

GEO. G. NASMITH.
JOHN A. AMYOT.

LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, Jan. 14, 1904.

Analyses of Waters from Dr. Hutchinson, London, Ont.

Total Hardness.	Colon B.	Staphylococc.	Streptococci.	No.	Free NH_3	Alb. NH_3	Ox. Cons.	Chlorine.	Nitrites and Nitrates.	——
235.5	—	—	—	67	.065	.045	......	1	......	Spring bank pond.
....	—	—	—	68	.045	.28	......	11	......	Cove.*
219.0	—	—	—	79	.075	.105	......	1	......	Ox Bow creek.
220.0	—	—	—	70	.01	.045	....	1	......	Crow creek.
....	—	—	+	71	.19	.34	......	6	......	N. branch Thames.*
....	—	—	+	72	1.04	.32	......	13	......	Clare's pond.
....	—	—	—	73	.31	.095	......	9	......	S. branch Thames.*

+ Present. — Absent.

GEO. G. NASMITH.
JOHN A. AMYOT.

Report on Disposal of Sewage by Public Charities in the Northern Portion of London.

By Drs. HODGETTS AND AMYOT.

When in the City of London an examination was made into the manner in which sewage of the several Public Institutions situated in the northern section of the city was disposed of. Dr. Hutchinson, M. H. O., of the city, kindly accompanied us.

We are pleased to state that we found the sewage of the following Institutions had been run into the common system.

Mount Hope Orphan Asylum, St. Joseph's Hospital, and Protestant Orphan's Home.

While that of the McCormick Home for aged is at present run into cesspools from which it is pumped, and then distributed by surface irrigation to the land situated to the rear, and in such a manner as must frequently cause a nuisance in the immediate neighborhood.

We were informed by the Lady Superintendent, that it was contemplated to construct septic tanks and distribute the effluent by subsurface tiles.

The sewage of the building now occupied by the sisters of St. Joseph, late Hellmuth College, is at present run into the north branch of the Thames River, the outlet being just above the Richmond Street Bridge.

We would recommend that the proposed system of the McCormick Home for aged be installed forthwith, under the supervision of the Local Board of Health, and that the owners of the old Hellmuth College be ordered by the Local Board of Health of the Township to discontinue the present method of sewage disposal, as it pollutes the waters of the north branch, from which a portion of the ice supply of the city is taken.

And we would recommend that septic tank and sub-surface distribution be forthwith substituted. Action should certainly not be deferred longer than the first of October.

All of which is respectfully submitted.

CHAS. A. HODGETTS.
JOHN A. AMYOT.

Reports of Committees.

PRESENTED AUG. 2nd AND 3rd, 1905.

Report of the Committee on Sewage and Water Supply (West) Re North Bay Sewerage System.

REPORT NO. 1, 1905.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN.—Your committee having met and considered the plans and specifications of the proposed sewerage sytem of the Town of North Bay as submitted by Mr. L. O. Clarke, C. E., O. L. S., dated March 25th, 1905, by which it was proposed to carry the sewage to two septic tanks, one in the west end at the foot of the Tenth St., and the other in the east end at the foot of Regin St., both tanks being situated close to the shores of Lake Nipissing upon which Lake the town is situated.

The present population of the town is between three and four thousand, and as no manufactories of any importance are established therein, the sewage will be chiefly of the class known as "household."

As the source of water supply is a most important factor in the consideration of the disposal of sewage, your committee would point out that the present source of the town supply is Lake Nipissing at a point a little further west of the proposed westerly outlet; but as this Board had approved of the source being changed in Trout Lake, (see Report of 1904, page 172) the particular point at which treated sewage is discharged into Lake Nipissing becomes very simplied and is one to be settled mainly from an engineering standpoint.

Under the conditions stated above your committee approves of the plans, but would recommend that the approval shall be subject to the following provisos,—

First. That the Trout Lake water supply be in operation and the present source be abandoned before the contemplated system be installed.

Second. That the septic tanks shall be constructed as part of the system and the operation of the system shall be dependent upon the use of the same from the time of inception.

Third. That the septic tanks be extended from time to time so that the capacity will always be equal to at least one day sewage flow.

Fourth. That should the Board at any time require further purification of the sewage by contact beds or other means, the municipality shall so provide for the same upon receiving notification from the Board.

Fifth. That the Town Council shall adopt a Plumbing By-law, similar in its provisions to the Model Plumbing By-law issued by this Board in 1897, a certified copy of which shall be filed with the Secretary of the Board, together with any changes and additions that may be made from time to time by the Municipal Council.

Sixth. That the Town Council shall provide for the inspection of all work done under the contract.

Seventh. That house connections shall be made under the supervision of the Town Inspector.

All of which is respectfully submitted.

J. J. CASSIDY, M. D.,
ALEX. THOMPSON, M. D.,
Signed, CHAS. A. HODGETTS, M. D.

REPORT NO. 2.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN.—Your committee having heard Report No. 2 read by your Secretary on a nuisance complained of by the residents of Mount Forest, and having read the evidence submitted to establish the charge, would advise that the Inspector of the Board, Dr. Bell, be requested to investigate the complained of nuisance and report to the Board as soon as possible.

Signed,
J. J. CASSIDY,
ALEX. THOMPSON,
CHAS. A. HODGETTS.

Port Carling, August 3rd, 1905.

REPORT NO. 3.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your committee on sewerage, West, having read the correspondence in reference to a proposed cemetery at Bothwell, recommend that a member of your committee, Dr. Thompson, and the Inspector of the Province, Dr. Bell, examine the site of the proposed cemetery and report on the same as soon as possible.

Signed,
J. J. CASSIDY,
ALEX. THOMPSON,
CHAS. A. HODGETTS.

August 3rd, 1905.

Report of the Committee on Sewerage and Water (East).

REPORT NO. 2.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your committee on sewerage, East, to whom has been referred the question of Belleville sewage, beg leave to report, that they have carefully considered the matter and suggest that as the Secretary and Dr. Boucher have been requested to visit Napanee in reference to health matters, that they also make a thorough examination into the proposed changes and additions to the Belleville systems of both water and sewerage, and that in the meantime the City Authorities be requested to have the plans prepared with a view to the future disposal of sewage by septic tank or otherwise, when required by your Board. At the same time we would recommend that your committee be requested to enquire into the water supply and sewerage of the Deaf and Dumb Institute.

All of which is respectfully submitted.

Signed,
R. P. BOUCHER,
W. OLDRIGHT.

Port Carling, August 3rd, 1905.

Report No. 3.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,— Your committee having seen the Report of the City Engineer of Toronto re Woodbine septic tank and bacteria beds and heard his verbal remarks and explanations before your Board at its current meeting, recommend that they approve of the same, with the further suggestion that sand filter beds be tried as part of the system, a few such beds taking the place pro tanto of some of the contact or bacteria beds.

All of which is respectfully submitted.

Signed,
R. P. Boucher,
W. Oldright.

August, 1905.

Report No. 4.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—Your committee having examined the report and plans of the Engineer of the City of Toronto regarding the construction of a storm water overflow on Roncesvalles Avenue and having heard his explanation of the same before your Board, recommend that you give your approval to the same.

All of which is respectfully submitted.

Signed,
R. P. Boucher,
W. Oldright.

August 3rd, 1905.

Report on Inspection of the Source of Water Supply of Ingersoll.

By Dr. JOHN A. AMYOT.

To the Chairman and Members of the Provincial Board of Health of Ontario.

Gentlemen,—At the request of the Town Council of the Town of Ingersoll, Dr. Hodgetts sent me to look into the water system of the Town.

During 1904 several specimens of the town water, which is supplied by a private Company, was sent to your Laboratory for analysis. Many of these showed infection with colon bacilli and streptococci. The Medical Health Officer, Dr. Coleridge, and the Local Board of Health of the town have been trying to find the cause and to devise means to correct the defect.

The water is collected in the open country (rather thickly populated and stocked farm land) from some three or four springs and the low lying swampy land in a shallow valley to the south-west of the town. The source is about one and one-half to two miles in length, the water being carried by an open creek to a small collecting basin, from it it is carried about one and one-half miles in addition by a wooden pipe eighteen inches in diameter to the pump-well on the bank some twenty feet above the level of the Thames River, there being a fall of about twenty feet in the three or three and a half miles from the head spring. A blue print showing the water shed is appended.

The source of colon bacilli and the other organisms found is not far to seek, in fact the surprising thing would be their absence in any continued run of samples. So far the town has not suffered to any great extent from typhoid fever. There is no means provided in the system to hold back infection if typhoid should ever break out on any of the farms draining into the collecting stream.

The system at the present time should not be an expensive one to run. The water all gravitates to the pumping station, the town is not elevated to any height in any part of its extent above the pumping station, and the pumps are partly run by water power with ten feet fall supplied by the overflow from the collecting system. Coal is not necessarily carted a long distance to supply the engine when steam is used. The staff is small. No part of the system is frilled and the Company charges consumers a good high rate for water, more a good deal, I was assured, than is charged in St. Thomas where the running expenses for pumping, and in addition filtering are much higher.

There is a general distrust of the water amongst the citizens in the town, tempting them to use the old fashioned back-yard well. The sub-soil is coarse and gravelly, making the danger the greater.

The Company expresses a willingness, even an eagerness, to do much to correct the faults of the system.

There are two courses open,—*First*, to build water-tight wells around each of the springs and connect these up by impervious piping with the present water intake pipe. It is questionable though if there would then be sufficient for the requirements of the town (average 500,000 gallons per day) if the ground and swamp water were excluded. Again the ground has a good deal of coarse gravel in it. They could never, in my opinion, feel absolutely safe as to infection even then. The wooden conduit would be another source of doubt, and besides the cost would be considerable.

At the time of my visit the ground was covered deeply with snow so that it was impossible to get a correct idea of the arrangement of the geological strata of the water-shed, and this is important in judging of the probable chances of the infection of the water in the springs.

The other course is filtration. There is land in the neighborhood of the pumping station where a filter could be ideally situated and the water could be carried to it by gravity. Good sand could be got in the Thames valley which is right at hand, so there would be no difficulty in handling the effluent from the sand washers. The water to be filtered coming from a sandy district is rarely very turbid and there is besides not much organic matter in it, so that a high rate of filtration would be possible (4,000,000—5,000,000 gallons per acre per day).

Situated as it is, the town is not likely to increase very rapidly in population and much could be done to prevent the present excessive waste of water so that a very small area of filtration would be required. Again, if filtration was done, piping in the water-bearing area would not have to be done.

All of which is respectfully submitted.

Signed, **John A. Amyot,**
Bacteriologist.

On July 10th a second visit was made to Ingersoll in connection with their water system.

On the 6th and 7th of July the Company in charge of the system were telephoned to announcing the visit. None of them came.

The gathering basin was visited in company with the Medical Health Officer and the Board of Health. The purpose of the visit was to ascertain when the ground was uncovered with snow the topography, to see approximately what the springs supplied, what was general surface water and what were the possibilities of pollution.

I am of opinion that the springs could not give a sufficient supply of themselves. The results of the chlorine examinations would seem to bear this out. The springs show each 4 parts of chlorine in 1,000,000 parts of water. (This quantity would indicate that the source is not deep-seated.) The water in the pump well and in the town tap show each three parts in a million. Surface waters usually show about 2 parts in a million. If this be so here, then the springs supply only one half of the water.

The surface water has to be taken in in order to procure a sufficient supply. The number of farms, etc., in the neighborhood will be a constant menace to the surface supply especially. I am more convinced than ever that this water to be safe should be filtered before distribution to the town, and this by the slow sand filtration method. All the physical conditions are favorable for this to be done economically, almost ideally.

All of which is respectfully submitted.

Signed,
JOHN A. AMYOT.

TORONTO, July 27th, 1905.

LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, July 27th, 1905.

Report on waters received from Mr. Duncan, of Ingersoll, on July 24th, 1905. Analyses were begun on same day.

Labratory numbers.	Sender's numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon bacilli.	Colonoid bacilli.	Chlorine in parts per million.
2061	30	North Spring............	None.	None.	None.	None.	4
2062	27	Harris Spring............	None.	None.	None.	Present.	4
2063	28	Gathering Basin..........	None.	None.	Present.	None.	3
2064	26	Pumping Well...........	None.	None.	Present.	None.	3
2065	32	C. P. R. Tap.............	None.	None.	None.	None.	3

The Harris spring shows infection with suspiciously intestinal bacteria. Both the gathering basin and the pumping well specimens show colon bacilli.

JOHN A. AMYOT.

LABORATORY OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, Dec. 21, 1904.

Report on waters received from Dr. Coleridge, of Ingersoll, on Dec. 9, 1904. Analyses were begun on same day.

Labratory numbers.	Sender's numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon bacilli.	Colonoid bacilli.	Chlorine in parts per million.
3654	24	Gathering Basin..........	None.	None.	Present.	None.	2
3655	33	C. P. R. Tap.............	None.	None.	Present.	None.	2
3656	42	Head Spring.............	None.	None.	None.	None.	2
3657	28	Harris Spring............	Present.	None.	None.	None.	2
3658	52	North Spring.............	None.	None.	None.	None.	2

Nos. 3654 and 3655, also 3657, are infected with disease-producing bacteria.

JOHN A. AMYOT.

Report on Burk's Falls Public Water Supply.

By Dr. JOHN A. AMYOT.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—During the summer of 1904 the authorities of Burk's Falls, backed by an overwhelmingy large majority of citizens, installed on the personal recommendation of Dr. P. H. Bryce, a gravity system of water supply.

The water is taken from Reazin Lake, a lake of 3¾ acres surface area, twenty-five feet deep and situated at the bottom of a well wooded basin, probably one-half mile wide by one mile long. Its wall is deficient at the western end. The basin is about 50 feet deep to the surface of the lake. The geological formation of the basin is such that it will probably never be inhabited by man, not even by animals. The land is not arable, besides it is difficult of access, so that it will seldom be visited. It is situated to the south of the village and at a level of about 300 feet above the Magnetawan River, on which is situated the village of Burk's Falls.

I could not find out the exact length of the water main, but it is estimated at 16,000 feet to the foot of the stand-pipe, which is 160 feet lower than the level of the lake. The stand-pipe is 70 feet high. The usual pressure in the town is 90 lbs. The pipe from the lake for the first 2,000 feet is a six-inch one. From there it is gradually reduced until at the river it is a one-inch pipe.

The supply from the lake was estimated as 40,000 gals. per day without lowering the level. This is from five to six times the daily consumption of the village, the consumption is variously estimated at from 5,000 to 10,000 gals. per day. The mills in the town pump their own water from the river.

On the face of it the system is an ideal one and presents chiefly the following advantages:—

1. It is the closest lake supply to the town.

2. It has a higher fall than could be got from any other possible source in the district.

3. The quantity is ample even for an extreme fire call.

4. There is practically no running cost.

5. The cost of installation was at least one-third less than it would have been from any other lake source.

6. The nature of the supply basin is such that it is not likely to be polluted or infected by such diseases or organisms as are usually guarded against in providing water supplies.

The stand-pipe is situated on a bye-way from the main, and is not habitually used. There seems to be an idea prevailing that it should be used only to increase the fire pressure. When no consumers are taking water, the water lies dead in the pipes. There is no constant outflow tap, and in consequence of this the water in the stand-pipe last winter froze and put it out of commission until spring if they had needed to use it.

From certain standpoints, unfortunately the water is not good.

1. It is excessively dark brown in color. In passing to the lake from the surface of the basin it passes through moss and bog for some hundreds of feet from nearly the whole circumference of the lake. This bog is thickly wooded and undergrown. The lake itself has a deep mud bottom and is full of rotting trees and vegetation.

2. It smells strongly swampy even in the summer time.

3. It tastes quite swampy, almost acrid.

4. All these three disadvantages are markedly intensified in the winter time when the ice forms and prevents the dissipation of the gases of decomposition.

5. The intake pipe being near the bottom some of the mud gets into the pipes, and this standing with its high organic content in the pipe, gives rise to considerable slime formation, which is decidedly objectionable looking.

6. There is general discontent in the village against the water. They cannot understand how it can be free from pathogenic bacteria when it looks and tastes so badly. One doctor who is particularly strong in his objection thinks it might cause typhoid fever.

7. This general discontent causes many of the people to go back to their sweet-tasting wells, where the water looks nice: but the wells in Burk's Falls are especially dangerous, the rock being so very close to the surface in so many places. Their last severe outbreak of typhoid fever was confined to a small section of the town, an unrecognized case of typhoid living above this well area probably infecting all below. There has been no typhoid in the village since the system was installed. The town authorities told me that only one or two had cut off their town supply.

8. There are a number of very beautiful lakes in the neighbourhood and these are generally easy of access. The water in nearly all of them is nearly colorless and is clear. Immediately invidious comparisons are made and this serves to augument the discontent.

In company with Mr. Lehmann, who has charge of the water system, I visited three of the lakes that are being spoken of in connection with this question, viz., Horn Lake, Pike Lake and Three Mile Lake.

Horn Lake is a very beautiful lake formed on a small scale very like Lake Joseph of the Muskoka Lakes. It is several miles in length and has many bays and islands. It is a great hunting resort and fishing place. The water is clear white and deep. The bottom of the lake is rocky. There is considerable land about it that will later be taken up for farming purposes. At the point at which it was proposed to take water there is a considerable saw-mill and some farms draining. There would always be chances of pollution and infection. To get a gravity system from this lake the pipe line would have to wind about in a very circuitous manner, probably ten miles. The pipe would in consequence have to be of considerable diameter.

This lake is situated to the north west of the town about three miles. There are three ridges between it and the town. The closest one to the lake rises about 40 or 50 feet above its level. If the pipe was carried across this it would mean pumping to this height. The water would then flow down to the town in spite of the other ridges, by gravity.

Both of these projects I would judge beyond the financing power of the town, especially since filtration would probably be necessary from hygienic reasons.

Pike Lake. This is a lake of about 200 acres area almost circular. The water is beaut ifully white and clear. The bottom is chiefly rock. There are some two or three farms bordering on it. On its south shore a nickle mine is in course of development. It may possibly be worked. This draining into the lake along with the drainage of the farms now discharging into it would make it risky hygienically and might necessitate filtration.

This lake is situated to the south east of the town about two miles distant. For a gravity system this lake would, according to Mr. Galt, require the putting of an eight-inch main and the main would have to be about 24,000 feet long. This would possibly make the cost one third to one half more than the present one, and besides they could not get the same pressure as the lake is some ninety-five feet less elevated than Reazin Lake.

It is a question if the town could have afforded this outlay. Still this it seems would have been the better place to take it from.

Three Mile Lake. This is a lake of about 100 acres, narrow and long, with a fairly white water, not so clear as the others. There is arable land all around it. It would seem to me to be about 40 feet lower than Pike Lake from which it is south. This lake runs considerable risk from a hygienic point of view, pasture lands and farms being so close to it. Besides, it would not be situated high enough to give a gravity system.

On the whole, Burk's Falls seems to have got a municipal water system from a source within its means. The other sources, with the exception of Pike Lake, would seem to be beyond their reach from the cost involved.

I am of the opinion that the present system could be improved at a very small outlay, and with this in view would recommend as follows:—

1. That provision be made to have a continual flow through the mains by providing an outflow at the river level. This would help to flush out the slime now accumulating from the pipes.

2. That the stand-pipe be used habitually. In this way some areation and ventilation would be got, and freezing in cold weather would be avoided.

3. That frequently the hydrants be opened to flush out the pipes.

4. That water in sufficient quantity be let off from the lake to lower its level some six or seven feet so that the shores of the lake could be got at in order to remove any projecting logs. That all the logs possible be removed from the lake. These logs and the continually adding vegetable matter are keeping up the supply of organic matter to putrify. Again, if the water is lowered, the neighboring bog will be dried out, the water

will lie at a lower level and not infuse out so much coloring matter from the vegetation.

5. If after this is done the improvement is not sufficient, resort ought to be made to areation and afterwards slow sand filtration. Two million gallons of such water could be filtered to one acre of sand bed, to the extent of making the water nearly colorless and practically odorless and tasteless.

The filter required for Burk's Falls when the quantity of water required would not exceed 10,000 gallons for some years to come, would not need to be a formidable affair and would be quite within the means of the town. It would be too bad to lay up all the money now sunk and make it non-returning, when the expenditure of a comparatively small sum would make the system an ideal one.

All of which is respectfully submitted.

Signed,
John A. Amyot.

Toronto, May 31st, 1905.

Quarterly Report of the Secretary.

CHAS. A. HODGETTS, M.D.

Presented to the Meeting of the Board, held October 24th and 25th, 1905.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—I beg to report as follows for the quarter ending September 30th, 1905.

The period has been marked by a decrease in both the cases reported and the deaths occurring from the notifiable contagious diseases, as will be seen from the tables as compiled by the chief clerk.

The fact that smallpox continues in our midst is undoubtedly due to the indifference shown by a large number of our citizens to avail themselves of the protection afforded by vaccination, thus showing themselves far inferior either in good sense or judgment than their compliance with other less important laws which lead the casual observer to believe, and at the same time indicating themselves to be slow in availing themselves of a long tried and well proven scientific procedure, which by adoption such countries as Germany and France have forever placed themselves as free from its disfiguring and death dealing influences.

We hope that before long this Province will have upon the statute books an Act similar in character to the wise provisions now in force in the two European countries just mentioned, where not only primary vaccination but secondary or revaccination is compulsory before manhood and womanhood have been reached. Failing this sanitary ordeal, those municipalities in which the present law is enforced as regards vaccination of school children, should be protected against financial losses incurred by reason of having to aid, medically, patients coming from other portions of the Province where the law is not enforced.

It would be particularly noted that at the present time an outbreak of smallpox exists in the townships situated on the eastern border of the counties of Northumberland and Peterboro and the western border of the county of Hastings. That such is unfortunately the case is due to the fact that some physicians have failed to diagnose the disease, either from ignorance of its true character or from a desire to suppress publicity. The result of this is seen in the fact that City of Toronto and other municipalities have been put to considerable expense and much inconvenience. The conditions of this in the sections just referred to is shown by Dr. Bell in his report on this disease.

It requires no words of mine to indicate to this Board the many examples which prove the truth of my contention that smallpox can be prevented by vaccination only, and given an enforcement of the law as just laid down the necessity for quarantine with all its expense to municipalities and irksomeness to individuals would be done away with.

The question of tuberculosis is necessarily one ever present before the public, and the 469 deaths during the past quarter accentuate the fact referred to in each of my previous reports, that, no municipality has as yet attempted to grapple with this White Plague. It is gratifying, however, to note that the City of Hamilton has taken up the question in apparently all seriousness, and the establishment of a local organization with funds to the value of $25,000 gives us hope that ere long this progressive city will have established a sanatorium for the care of the tuberculous poor, and become the leader in availing itself of the provisions of the Act *re* Municipal Sanatoria. It is sincerely hoped the good example will be followed in the near future by other cities as also by the counties, for with a number of sanatoria throughout Ontario the opportunity will not only be afforded for the care of the indigent, but many will be instructed how to live without infecting others; some will be placed in a condition of health as to permit of their continuing as wage earners, and it will be found that the onward progress of the scourge will be checked.

The attention of the Board is directed to the increase of outbreaks of enteric fever in the Province. I would particularly mention the following as reported during this year:

Cases and Deaths from Enteric Fever for September.

Place	*Cases*	*Deaths*
Toronto	42	7
Toronto Junction	16	0
Parry Sound	20	2
Pembroke	20	1
London	11	0
Brantford	10	1
Kingston	2	0
Brockville	5	1
Hamilton	8	0
Guelph	12	2
Port Arthur	15	1
Fort William	12	3
Bracebridge	7	0
Copper Cliff	9	1
North Bay	3	0
Harley	3	0
Haldimand	3	0
Cramahe	3	0
Uxbridge	2	0
Tillsonburg	6	0
Peterboro	3	0
Hintonburg	3	0
Rochester	4	0
Raleigh	2	0
Chatham Tp.	2	0
New Liskeard	4	2
Rainy River	8	0
Kenora	2	0
Cobden	7	0
Chesterville	3	0
Clarence	2	0
Nottawasaga	3	0
Galt	2	0
Guelph Tp.	4	0
Etobicoke	3	0

Places having only one case not included.

It is just possible that if physicians complied with the Public Health Act and notified each case that the outbreaks would be more numerous and the cases in those already reported would be larger than stated,—for example, the M.H.O. of Toronto reports:

The increasing frequency with which municipal authorities ignore the provisions of section 30 of the Public Health Act calls for some definite action of this Board if the health not only of the inhabitants of those municipalities controvening the Act, but citizens of our Province generally is to be conserved.

I refer more particularly to section 30 of the Public Health Act, which requires that not only the plans of public sewerage systems must be submitted by the council of any city, town or village to this Board before their adoption by the council, but "Whenever the construction of a common sewer is contemplated," it is the duty of the council of any city, town or village, to submit to this Board before their adoption all plans in connection with said common sewer.

The need for the enforcement of this wise provision becomes more apparent with the increased growth of our cities and other urban municipalities. and also from the fact that in some instances municipalities have installed systems in direct opposition to the decisions of the Board. Further instances can be given where municipal councils have approved of the construction of sewers by manufacturing firms, etc., where there is no municipal system, and as a consequence streams and water courses are to-day polluted in a manner which this Board knows but little of. The fact, however, remains the same, that in many instances the health of the general public is endangered, for in these days of rapid transit and commercial and social interchange the limit cannot be placed upon the definition of "public." This being the case, it is necessary for this Board to take such action as it deems necessary in the public interests, to prevent the construction of common sewers in the cities, towns and villages of this Province without the Board having first approved thereof. Further, any common sewer built since the passing of the Health Act, should be inspected and reported upon by an officer of the Board, and where necessary, in the interests of the public health, such alterations should be ordered as are proper.

Epidemic Cerebro-Spinal Meningitis.

I have again to direct your attention to the continued presence of this disease in various portions of the Province during the past quarter, those of which I have official knowledge are Eganville, 6 cases and 2 deaths; Mountain, 4 cases; Nipissing Tp., 2 cases; Huntley Tp., 2 cases; Monteagle and H. (Hastings), 1 death; Powassin (Parry Sound), several cases, and several new cases reported in the districts surrounding the village of Carp.

As bacteriological examinations show that the specific organism is present in the secretions of the nose and mouth for a period of two weeks after the onsent of the disease, and further, they have been found in the same secretions of those nursing patients, it does appear that the Board should make some definite pronouncement on the disease for the guidance of health authorities.

To this end I would suggest the issuing of an order to the municipalities referred to in the Act requiring their compliance with the statute, and at the same time they be informed what this Board considers a "common sewer."

In this connection, I would recommend that the present Public Health Act be amended whereby powers similar in character to those possessed by the Local Government Board of England be vested in the Provincial Board of Health, whereby the approval of all sewerage and water systems must be given before the money can be raised for the carrying on of the work.

In conclusion, reference should be made to municipal councils and boards of health. The increasing number of complants which reach this office, many of a trivial character, indicate the apathy and indifference on the part of the local authorities to grapple with questions which should be dealt with under the powers given them under the Public Health Act. This is particularly the case in the towns and villages, where it would appear the Boards are afraid of enforcing the law, being apparently overawed by a something which they will not name. This unsatisfactory condition can only be remedied by the appointment of a County or District Boards of Health with salaried Medical Health Officers.

COMPARATIVE TABLE OF INFECTIUS DISEASES.

The Third Quarter ending Sept. 30*th*, 1905, *with the same month*, 1904.

Diseases	*Cases.*	*Deaths.*	*Cases.*	*Deaths.*
Smallpox	30	2	29	2
Scarlet fever	109	5	325	25
Diphtheria	402	52	485	58
Measles	148	8	30	38
Whooping Cough	313	51	75	30
Typhoid	612	105	540	126
Tuberculosis	489	441	538	513
	2,038	664	2,022	729

Laboratory Reports

By J. A. AMYOT, M.D.

Presented at Quarterly Meeting held October, 1905.

To the Chairman and Members of the Board of Health of Ontario.

Gentlemen,—I have the honor to present you the following epitomized report of the work done in your laboratories during the quarter ending Sept. 30th, 1905.

Summary of the specimens examined in the Laboratory of the Provincial Board of Health during the quarter ending Sept. 30th, 1905:

Municipalities.	Diphtheretic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous specimens.	Waters.		Total number for month.
	Release.		Diagnosis.									
	–	—	–	—	+	—	+	—		Chemical	Bacterial	
July, 1905.......	8	28	20	44	57	98	16	66	18	..	69	424
Aug., 1905.......	6	11	16	41	60	81	36	104	10	..	65	431
Sept., 1905.......	6	26	17	23	67	93	38	113	11	12	136	541
	20	65	53	108	184	272	90	283	39	12	270	1396
	85		161		456		373		39	282		
	246											

Diphtheria exudates	246
Tuberculous sputa	456
Typhoid bloods	373
Miscellaneous	39
Waters	282
Total	1,396

Besides the above, there were examined for the City of Toronto:

Sewage	98 specimens
Water chemically	14 specimens
	112

Total number of specimens examined during quarter, 1,508.

The last set of Toronto sewage samples are yet to be examined. A report on our findings in this respect will be presented at the next quarterly meeting.

Notes arising out of above Examinations.

1st. There were examined from the City of Toronto's water supply 61 specimens of water on as many days. Thirteen of these specimens showed infection of a probably sewage origin. Seven times colon bacilli were found, five times bacilli suspiciously intestional in origin, and on one occasion stoptococci were found.

In July 12 specimens were examined with no infection, in August 24 specimens were examined with eight infections, in September 25 were examined with 5 infections.

The days of infection were as last year in groups of days, *i.e.*, Aug. 16, 17, 18, 21, 22 and 24, September 14, 25, 26, 27 and 29.

This is a condition which should not be tolerated in a wealthy and boasting city like Toronto. It shows a lack of interest in the citizens, a lethargy, and lack of an appreciation of their duty in those shaping the policy of expenditure in the city.

Typhoid fever is more abundant than for some years. It is not being reported. There is suspicion even that the fact is being suppressed.

During the quarter 87 specimens of suspected typhoid blood were sent in by Toronto physicians, and of these 23 were shown to be typhoid fever in origin.

2nd. Two specimens of organs were examined for suspected anthrax during the quarter. One of these proved positive. The case is from Collingwood in a man who had skinned a beast that had died from the disease. This gives us another tannery section with anthrax.

3rd. Based on analyses made in the laboratory and on an inspection subsequently made, Brampton instituted suit against one Dyer for allowing barn-yard refuse to run into the lake, the source of supply to the town. The case was laid before the magistrate on the Health Act. The defendant was fined one dollar and costs and ordered to abate the nuisance.

4th. Ingersol is endeavoring to force the company supplying them with water to put in a system of filtration, in order to purify their supply. This is also as a result of the analyses and inspection subsequently in connection with same water supply.

5th. Several other towns of Ontario are being stimulated to the procuring of more hygenic water supplies, from the prodding they have got from the laboratory, viz., St. Catharines, Owen Sound, Burk's Falls, Parry Sound, Toronto Junction, Fort William, Cobalt, Bying Inlet, Peterborough, Merritton, Port Dalhousie, Sturgeon Falls, Dundas, Sault Ste. Marie, Steelton, Aurora, Guelph, Brockville, etc.

6th. More physicians are taking advantage of the facilities offered by the Board through the laboratories, for the diagnosis of infectious diseases, the examination of waters, etc., and yet not anything like the number that should are doing so. This means either they do not know of these facilities, which are free to them, or else they have already begun to lose interest in their work or are not doing their duty to their patients.

Summary for Quarter Ending September 30th, 1905.

County.	Municipalities.	Diphtheretic Swabs.				Tuberculous sputa.		Typhoid Bloods.		Miscellaneous specimens.	Waters.		Total number for quarter.
		Release.		Diagnosis.									
		+	−	+	−	+	−	+	−		Chemical.	Bacterial.	
Algoma	4				1	2	1	1				10	15
Brant	1						1						1
Bruce	11			1		3	5	2	4			9	24
Carleton	3	1		1		1	1		1	1		2	8
Dufferin	3						5		4				9
Elgin	2			4	5	5	9	2	2			24	51
Essex	18			2		1			9	5		2	19
Frontenac	16	7	20	15	15	19	40	9	28	7		2	162
Grey	10			2	1	3	14		2	6		23	51
Haldimand	6			1	1	1	4	2	1				10
Haliburton	0												0
Halton	6			4	1	5	2	1	2				15
Hastings	12					6	9	1	6			2	24
Huron	3					2	3		2			1	8
Kent	10					11	5		3				19
Lambton	10				1	1	9	4	13	1		1	30
Lanark	8	3	3	2	7	1	2	1	3	1			23
Leeds & Gren.	26				3	9	17	3	3	4		10	46
Lenn. & Add.	17	1	1	2	1	5	8	1	4	1		2	26
Lincoln	8					1	9	2	3			2	17
Middlesex	4				1		1		5				7
Muskoka	10	1	3	2	3	4	1	1	8			13	36
Nipissing	3				1	2	2		1			4	10
Norfolk	7					6	5		4	1		2	18
North. & Dur.	17				2	7	8	1	3	1		1	23
Ontario	12				1	6	7	1	7				22
Oxford	14			1	2	11	8	3	18			16	59
Parry Sound	9				1	2	9	9	22			33	76
Peel	4		2	1		1			1			3	8
Perth	5			1	2	2	1		1	1			8
Peterboro	8				1	3	7	1	1	1		5	19
Pres. & Russ.	3					2			1				3
Prince Edw'd	1				1								1
Rainy River	3				5		1						6
Renfrew	7		1	1		2	4	1	1	1		3	14
Simcoe	25		2	1	8	10	12	9	7	1		3	53
Stor., D. & G.	10				5	6	8			1		1	21
Thunder Bay	3						1	2	2				5
Victoria	5	1	19	1	14		2	2	3			3	45
Waterloo	19	1		1	4	6	10	4	10	1		11	48
Welland	8			1		1	3		1			3	10
Wellington	16		1		7	5	5	2	11	1		2	34
Wentworth	8					5	3		6		12	13	39
York	29	5	13	9	14	27	30	25	79	4		64	270
Totals		20	65	53	108	184	272	90	283	39	12	270	1396

Report on Dundas Water System.

By Drs. HODGETTS and AMYOT.

The present supply of water of the town being inadequate the authorities have been looking around for a source from which to secure an additional supply which will be sufficient for domestic, manufacturing and fire purposes.

It has been found by Mr. John F. Armour, C.E., acting on behalf of the corporation, that the springs on the high lands above the town are diminishing in volume, the spring with the largest flow having diminished 75 per cent. in twenty years. Under these conditions, it is no wonder the Water Works Committee have been considering the future.

The following statement prepared by Mr. Armour shows the estimated consumption of water for the year 1904:

(*Population of Town assumed at* 3,500.)

21 Domestic services (metered)	472,045 gals	
91 Domestic services (flat rate)	4,091,360 gals.	
		4,563,405 gals.
10 Commercial services (metered)	4,937,406 gals.	
23 Commercial services (flat rate)	546,911 gals.	
		5,484,317 gals.

Municipal.

High and Public School building (estimated)	50,000 gals.	
Armoury	50,000 gals.	
Drinking fountain	100,000 gals.	
Street sprinkling	2,500,000 gals.	
Fire purposes	1,250,000 gals.	
		3,950,000 gals.

Summary.

	Gals. per year.	Gals. per day.	Gals. per head per day.
Domestic	4,563,405	12,502	3.57
Commercial	5,484,317	15,026	4.29
Municipal	3,950,000	10,822	3.09
Loss and waste	7,975,250	21,850	6.25
	21,972,972	60,200	17.20

From this estimate it would appear that while only 12,502 gallons are required each day for 3,500 persons, or 3.57 gallons per head per day, yet 21,850 gallons or 6.23 gallons each per head per day are computed for loss and waste, or an excess of 9.248 gallons per day of waste over domestic consumption, a fact which should receive the careful consideration of the Committee, for such a proportional waste can only be accounted for by either structural defects in the present system or carelessness on the part of the inhabitants, both preventable to a large degree.

The two sources from which the authorities have thought it possible to secure their water supply are, (*a*) the Dundas Creek, which arises in Beverley Township situated in the northwest corner of Wentworth County and flowing through the Townships of Beverley and Flamboro West, the watershed being of about 100 square miles in area. (*b*) The basin of the Desjardines Canal adjacent to the town.

From an engineering standpoint the use of the creek water taken from a point near Greensville would mean simply a gravity system, while recourse to the canal water would necessitate the installment of a pumping plant.

As viewed from the more important standpoint, viz., the securing of an adequate supply of potable water, we are of the opinion that in either case in will be necessary for the corporation to provide for the filtration of the water, as the waters of the creek are polluted by numerous paper, cloth and other mills situated thereon it; while the waters of the canal receive a portion of the sewage of the City of Hamilton, although the City has now under consideration plans for the erection of septic tank and contact or sand beds for the treatment of the same.

We would recommend that the town authorities carefully estimate the amount of water which could be supplied at a suitable point near Greensville, and also take legal opinion as to claims that might arise from holders of so-called riparian rights; and if the engineer is satisfied as to permanency of quality that they then consider the installing of a gravity system, having as a part thereof the filtration of the water by slow sand filters, and that the storage reservoir be made of ample capacity and properly protected.

Failing in this as a source of supply, we see no other alternative than to filter the canal water and pump it to the reservoir, or consider the advisability of entering into negotiations with the City of Hamilton for an adequate supply from the city service.

We beg to append the Laboratory Report on samples collected by the town officials.

Report on Waters received from John F. Armour, Town Engineer of Dundas.

On September 14th and 16th, 1905,

Laboratory Numbers.	Where collected from.	In parts per million			Steptococci.	Staphylococci.	Colon Bacilli.	Colonoid Bacilli.	Remarks.
		Free Ammonia.	Albuminoid Ammonia.	Chlorine.					
2689 and 2702.	Dundas Creek near Morden's quarry....................	.07	.155	3	None.	None.	Present.	None.	
2690 and 2700..	Lock dam	.07	.155	2	None.	None.	None. ..	Present.	
2691 and 2699..	Wallace well................	.01	.045	6	None.	None.	Present.	None.	
3692 and 2701..	Dundas reservoir...........	.05	.175	4	None.	None.	Present.	None.	
2693 and 2703..	Wm. Clark's dam	.03	.14	2	None.	None.	Present.	None.	
2694 and 2697..	Vinegar Hill bridge	.055	.22	2	None.	None.	Present.	None.	
2695 and 2698..	Enright's spring.	.025	.085	4	None.	None.	Present.	None.	
2721 and 2731..	East end canal basin........	.20	.275	20	None.	None.	Present.	None.	
2722 and 2728..	Half mile east canal basin...	.145	.36	21	None.	None.	None...	None.	
2723 and 2727.	Desjardin's canal half way between basins...........	.25	.23	19	None.	None.	Present.	None.	
2724 and 2729..	Dundas Creek at marsh.....	.11	.215	13	None.	None	Present.	None.	
2725 and 2730..	West end canal basin	.14	.375	20	None.	None.	Present.	None.	

The canal water shows a very considerable pollution chemically which is most likely animal in origin.

Practically all of the waters are infected with intestinal bacteria. None of these should be drunk without being previously boiled. None of them can safely be used without efficient filtration for a town supply. The upper seven would show best result.

Analysis of Water from Dundas, October 14th, 1905.

No.	Free NH_3	Alb. NH_3	Ox. Con.	Chlorine.	——	
2697	.055	.22	....	2		Creek at Vinegar hill bridge.
2698	.025	.085	....	4		Enright's spring.
2699	.01	.045	....	6		Wallace well.
2700	.07	.155	....	2		Lockbinn's dam.
2701	.05	.175	....	4		Reservoir.
2702	.07	.155	....	3		Dundas creek.
2703	.03	.14	....	2		Wm. Clark's dam.

Analysis of Water received October 18th, 1905.

No.	Free NH_3	Alb. NH_3	Ox. Con.	Chlorine.	——	
2727	.25	.23	....	19		Desjardin's canal.
2728	.145	.36	....	21		E. end canal basin.
2729	.11	.215	....	13		Dundas creek.
2730	.14	.375	....	20		W. end canal basin.
2731	.20	.275	....	20		Desjardin's canal, ½ mile from basin

Report on Water received from Dr. Bertram, of Dundas.

On March 30th, 1905.

Analysis was begun on same day.

Laboratory Number.	Sender's Number.	Where collected from.	Strepto-cocci.	Straphy-lococci.	Colon Bacilli.	Colonoid Bacilli.	Chlorine in parts per million.
0831	24	J. Brown's well	None.	None.	None.	Present.	24

This water shows chemical pollution and at the same time infection with a suspiciously intestinal bacterium. It is not a safe drinking water.

Report on Napanee Nuisance.

By Drs. BOUCHER and HODGETTS.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your committee begs to report as follows, upon the question of the Napanee nuisance, referred to it at the last quarterly meeting.

A visit was made to the town on October 17th instant, when the site of the nuisance was carefully inspected in company with the chairman and members of the Local Board of Health, and Dr. Cowan, M.H.O.

The facts are briefly as follows: Mr. Greeves, who carries on the business of a milk dealer, and lives in one of the more thickly populated blocks of the town, has for some years kept, during the late fall and early spring months, a number of cattle variously estimated at from 20 to 30 stalled in sheds in the rear of his premises. During the balance of the year the cattle are pastured, but his custom is to milk daily throughout the year upon these premises.

It will thus be seen for nearly seven months in each year, so large a number of cattle are stalled upon the premises.

The property owned by Mr. Greaves has recently been filled in, and at the present time is a foot or more above the surrounding property in the block, which is soft and presents every evidence of having once been a swamp: upon this newly made land, new cow sheds are in process of erection; while upon the next lot to the south, rented by Mr. Greaves, are some old and dilapidated sheds used as cow sheds.

We found every evidence that these premises had recently been cleaned up, but from the appearance of the ground of the rented lot, as also from the condition of the adjoining lots, we are of the opinion that there has been considerable seepage from the sheds, etc., such as would at times readily create a nuisance. This was evidenced by the pollution which existed at the date of inspection.

The stables are situated less than 100 feet from the nearest of Mr. Greave's neighbors.

It would appear that complaints having been made to the Local Board of Health, that body investigated the nuisance and having decided the same existed, forthwith ordered its abatement within two days, but upon Mr. Greaves refusing to obey the order of the board, it was further decided to prosecute him, but here a difficulty arose, no one would lay the complaint, and we were informed by the board that the police magistrate intimated a conviction could not be obtained, the result being that Mr. Greaves taking advantage of the indecision of the local authorities, proceeded to erect a new shed, in which he proposes to keep the cattle this winter.

Before meeting with the Board a visit was paid to the premises of three other milk dealers.

Our instruction to the local Board of Health was, they having the power to prosecute where a nuisance existed, it was their duty to prosecute; and under the circumstances we were of the opinion the case did not come within the Province of the Provincial Board.

In conclusion we would state that the instance was one illustrating a lack of judgment and decision on the part of the local health authorities who seem to have been overawed by the owner of the cows.

Report on the Belleville Sewerage System.

By Drs. BOUCHER and HODGETTS.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Having been instructed to visit the City of Belleville and report upon the system of sewerage which it is proposed to install there, we would report as follows:—

The present area of the city is less than four square miles, while the population is 11,000, slightly more than one half of which live on that portion lying to the east of the Moira River, at its junction with the Bay of Quinte upon whose shores the city is situated, and parallel to which most of the residential streets run, the intersecting ones paralleling the river.

The geological formation to the west of the river is chiefly lime stone similar in character to that forming the river banks and bed, while the land to the east is sand and gravel with the hard pan found at varing depths. The natural lay of the land is toward the river and the lake front.

The portion of the city at present seweraged is bounded by the river on the west, Bridge street on the south, Charles street on the east and Hotel street on the north, the outlet being at a point just below the lower bridge, the discharge being through a 12 inch pipe.

It is now proposed to lay a trunk sewer on Dundas street for the portion of the city to the east of the river, and one on Coleman street for the portion to the west, the outlet for the former to be in the deep water of the river; while that on Coleman street would be carried south and be extended into deep water off the point south of the junction of Coleman and Water streets. The scheme provides for the extension of the sewers upon both sides of the river, the most northerly point to be drained being the property of the Grand Trunk Railway.

We have been informed that the present system has the following connections, and the sewage as seen emptying into the river was typically domestic.

In addition to the present system we find that many of the stores situated on the west side of Front dt. run their sewage directly into the river, while some of the private houses on the west bank have private drains emptying similarly in this manner, the sewage from stores and houses finds separate entrance, permission in some instances having been asked and given by the council.

After going over the districts to be sewered in company with the mayor and other representatives of the council and board of health, also the city clerk and commissioner Hulme, to whom we are indebted for much valuable information and for many attentions shown during our brief visit, we are of the opinion that the general plan to install a system of sewerage is a good one, and with the exception of considerable rock cutting in the western district will present few engineering difficulties. This portion of the plan we would approve of, but the proposal to empty the sewage into either the river current or bay is one presenting serious objections. Municipal authorities generally have been led in the past to believe that it was the right and proper thing to discharge sewage into water, more particularly running water, hence all schemes of sewage disposal for urban municipalities adjacent to river or lake have presented this as the scheme "par excellent."

With our present knowledge of the possibilities of sewage disposal by means of one or other of the accepted systems of treatment, together with our knowledge of the danger of pollution of water supplies, by reason of the constant and long continued discharge of raw sewage into both lake and river, even where the same is at some distance, and in the latter case often below the point from which the water supply is taken, it would be wrong for us to recommend to you that portion of the scheme which has for its object the pollution of the waters of the bay by discharging therein the sewage in an untreated condition.

We would, therefore, suggest that the corporation secure the services of a competent engineer to prepare plans for the construction of a trunk sewer, which would convey the sewage to a point where treatment could be properly provided for.

To permit of this being done it may be necessary to syphon the sewage from the west side of the river and carry the trunk sewer to a point east of the river.

After suitable treatment of the effluent, it may then be carried to the bay, east of the mouth of the river.

We would further recommend that the council close all the private services emptying into the river, and that the practice be forthwith prohibited.

Re Application of F. W. Galbraith, Port Hope.

This is an application to the board asking for its sanction to convert an existing drain into a closed sewer, the outlet of which would be in Smith Creek at a point where there is a depth of two and a half feet.

Having inspected the site of the present drain and considered the relation of the property which it is proposed to drain to the existing sewers, I am of the opinion that the application should be disallowed for the following reasons:—

(a) The present drain should be maintained solely for the purpose of carrying off the surface and spring waters.

(b) Its conversion into a sewer would be to create a nuisance at the outlet.

(c) It is possible to drain into one or the other of the sewers on North and Bedford streets, and for this purpose a sewer should be constructed on Brown street, as there are houses on both sides of the road, to the inmates of which a sewer is of vital importance as it is to Mr. Galbraith.

Further, after careful consideration of the whole question of the sewerage of the town of Port Hope, I am of the opinion this Board should inform the corporation of the Town of Port Hope, that all private sewers with outlets in Smith's Creek must be removed, and that the town be recommended to prepare a general system for the approval of this Board, having for its object the treatment of the sewage, as the Board can no longer approve of a continuance of the present system.

All of which is respectfully submitted.

CHAS. A. HODGETTS.

TORONTO, October 20th, 1905.

Report re Pollution of Grand River.

Brantford Sewage.

The present system of sewerage of the City of Brantford has some 1,500 house and factory connections, and the daily discharge at the outfall is computed by Mr. Jones, City Engineer, to be 1,000,000 gallons.

The point at which the sewage reaches the river is narrow as compared to the points immediately above and below, and the volume of the river at this point is estimated at 144,000,000 gallons daily.

At the time of inspection (August 30th), the sewage seemed to present the characteristics chiefly appertaining to that classed as domestic, and there did not exist in the immediate vicinity along the shores of the river anything that could be considered a nuisance.

All of which is respectfully submitted.

CHAS. A. HODGETTS.
JOHN A. AMYOT.

Report re Tavistock Woollen Mills.

The Local Board of Health of the Township of East Zorra having referred to this Board the question of the measures to be adopted for the abatement of the nuisance caused by the improper manner in which the factory waste is disposed of by the proprietor of the above mentioned woollen mills, we beg to report as follows:—

The effluent from the mill is roughly screened and then run by an open ditch into the creek which flows through the adjoining pasture and farm lands, and we are of the opinion it must at times create a nuisance and may possibly be a source of danger to cattle drinking of the polluted water.

We would recommend that the proprietor of the mill be instructed to discontinue the present methods of disposal, and provide for treatment of the factory effluent by screening and tankage equal in capacity to at least 24 hours outflow, and subsequent treatment either by contact or filter beds. The tank should preferably be constructed of concrete. This method, we are of the opinion could be put into operation at a comparatively small cost.

All of which is respectfully submitted.

CHAS A. HODGETTS.
JOHN A. AMYOT.

Report of the Special Committee.

Composed of the Committees on Sewage Disposal and Water Supply, East and West,

On the Sanitation of the Muskoka, Kawartha Lakes and other Summer Resorts.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—Your Committee herewith submits the reports of Drs. Hodgetts, Amyot and Bell, endorsed by your Committee together with a resolution of your Committee as follows:—

Moved by Dr. Cassidy, seconded by Dr. Boucher. That a sub-committee be appointed to prepare a circular pamphlet containing directions in detail for the disposal of refuse under varying circumstances in summer resorts, and that copies of this circular pamphlet be eventually printed, after submission to the Board at its next meeting, with the object of distributing to owners, house holders and others, through all the health resorts in the Province, to township clerks, hotel keepers and others in the Kawartha, Muskoka and other tourist districts; and that the same sub-committee adopt a series of regulations to be enforced throughout the Province; and that the secretary and Dr. Oldwright be this sub-committee.

All of which is respectfull submitted.

(Signed) Wm. Oldright,
Chairman.
J. J. Cassidy.
R. P. Boucher.

Report on Inspection of Musokoka Lakes.

By Drs. HODGETTS and AMYOT.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—We beg to submit the second report on the sanitary condition of the Muskoka Lakes.

The inspection was made during the first and second weeks of September, at a time when perhaps the best opportunity was afforded for judging of the manner in which a large number of "the cottagers" left their premises at the end of the season, and also of personally ascertaining the care taken by hotel proprietors during the season of their buildings and premises.

The inspection this year included the towns of Bracebridge and Gravenhurst and the Village of Port Carling, also the hamlets of Rosseau and Bala Falls with 554 hotels and private houses. Speaking generally we found evidence of an increased interest on the part of the residents in sanitary affairs, and we would express the pleasure we felt in the many words of encouragement and expressions of approval of our mission from the cottagers with whom we came personally in contact.

It is not proposed in this report to give in detail a criticism of each place inspected, but to confine ourselves to generalities and lay down principles which will aid in the formulating of rules applicable to all summer resorts in the Province, for we are of the opinion that there are many summer resorts the residents of which have been less alive to sanitary matters than those of Muskoka, consequently the disposal of household wastes and the selection and protection of water used for domestic purposes is more neglected than in Muskoka.

The sanitation of a summer resort may be considered under the following heads:—

(a) Water supply.

(b) The disposal of human excreta.

(c) The disposal of kitchen and other waste, (1, destructable; 2, non-destructable.)

(d) House sanitation.

Water Supply.

This we found to be taken either from a lake, well or spring, the former being that from which the majority draw their supply. Speaking generally, the well and spring waters are unsafe, owing to the fact that the possibilities of pollution were found to be greater than in the case of the lake supplies, although in many instances the cool, limpid and non-tasteful water was deceptively subtle. Exceptions do exist, however, in the district, of instances where the spring water is good, particularly is this the case at the Monteith House, Rosseau, where the gathering ground of the spring is carefully preserved from pollution either by man or animal. We found instances, however, where, the summer resident runs considerable risk by taking the well or spring water without boiling it.

The method of supplying the water to the house is by pail, hand pumps, force pumps, ram hot air, and steam engines, tanks being frequently used as reservoirs; indeed many of the hotels and some of the private houses have a complete water system, which includes hot and cold water, fixed wash stands and all the convenience found in a modern hotel or home.

The Disposal of Human Excreta.

It is found that this question is regulated largely by the means of the owner or tenant, and secondly by his æsthetic taste based upon sanitary knowledge or inclinations.

We thus find the following methods in operation: the water closet, the dry earth closet (pail or box), and the cesspool, and in a few instances the emptying of excreta directly into the waters of the lake.

In those instances where the septic tank system with disposal by means of subsurface tiles has been introduced and is intelligently cared for, the water system was found to be giving satisfaction, and we would strongly recommend this system for use by all hotel and boarding house proprietors where a system of water works is in operation; and when the means of the owners of private houses will permit, such a method should be used, indeed it would be well to prohibit the installing of a water system without the accompanying sewage disposal plant.

A number of private houses are supplied with dry earth closets, a pail or box being used, the removal being daily weekly, or often only at the end of the season. We found it almost a universal custom to use ashes instead of dry earth, consequently the disintegration of excrement is retarded, and this is further prevented by the use of dry or liquid deorderants and disinfectants.

The primitive cesspool is most commonly used in Muskoka, even being found at some of the hotels and boarding houses where large accumulations were found. The depth of the closet is usually regulated by the depth of the soil, but whether shallow or deep, the strata of rock of is soon reached and after each rain fall there must be considerable pollution therefrom. Fortunately the period which intervenes between the summer seasons, affords an opportunity for disintegration to take place, but with the increase in population there must be an increase in the possibility of pollution of the water supply.

The empyting of excreta directly into the lakes needs no words of condemnation from us for such a procedure is in our opinion criminal and should be stopped forthwith.

Kitchen and other Waste.

Where the summer residence is situated adjacent to a farm much of the kitchen waste is kept in a receptable and removed daily by the farmer and fed to hogs. In more isolated places, however, "the slops" are thrown into a pit either natural or artificial as remote as possible from the house, and covered from time to time by the more careful householder with earth to which is often added chloride of lime or some deoderant. An improvement in this system is found in the collecting of the solid portions apart from the liquid and the subsequent cremation thereof.

The non-destructible refuse which consists mainly of the empty tins used as containers for meat, fruit and vegetables give the housekeeper more trouble, at least their presence is more seen than felt, and so the tins are committed to the deep—out of sight out of mind—but a more casual scrutiny of the shores of many of the islands evidences the frequency of this custom, and in the neighborhood of some of the hotels "the dump" was evidence that more than empty tins found a final resting place in the limpid waters of the lakes. We found that a few of the "cottagers" took the trouble to bury their tin ware and in so doing were adding to their possessions.

While generally speaking the surroundings of the houses were clean and tidy and bore evidence of considerable pains being taken to make and keep the premises inviting and healthy, yet, there were many instances where the property, more especially the portion surrounding the kitchen, was littered with discarded wearing apparel, empty tins, packing boxes, straw, etc., which accumulating year after year not only mar the beauty of a summer home, but soon make filth and dirt.

House Sanitation.

A few words in regard to the space allowed for bed-room accommodation. In some of the houses visited we are convinced that too many persons are croweded into the bedrooms. This no doubt arises from the fact that during the months of July and August the number of guests far exceed the space required for the family. The fact seems to be lost sight of that even in camps too many persons may be crowded together in such a manner as to prevent each having a sufficient supply of fresh air. To overcome this, additional sleeping space for visitors should be provided in tents, preferably erected on moveable platforms. The attention of local health authorities should be directed in this particular to the hotels and boarding houses, nearly all of which are offenders.

A measure which the hotel proprietors at present have not adopted is the providing of fire escapes. This may not seem so important as if they were open in the winter months, but with the introduction of gas and the careless handling of oil lamps, the danger of fire is more or less present, and iron steps and landings at suitable places should be erected.

There is one important and at the same time perhaps the most difficult question to deal with in this and other summer resorts similar in character to Muskoka, *i.e.*, the pollution of the waters by the vessels plying on its waters.

At present, kitchen waste and slops are thrown overboard and go to feed the birds that may be seen following in the wake of all steamers—while the excrement from the closets and urinals are most conveniently deposited in the lake, although it is impossible in the case of two of the steamers, a portion at least of this sewage undergoes septic action in tanks provided for this receptacle. Both of these sources of pollution should be discontinued. The solid kitchen waste should be cremated in the furnace, while the liquid portion and the excrementation matter might be retained in proper receptacles and transferred tn the land at convenient points.

Conclusion and Recommendations.

We would recommend the adoption of a series of regulations by the Board applicable to all summer resorts in the Province. The same to deal with the following subjects:—

(*a*) The water supply, its selection, protection and annual examination.

(*b*) The disposal of sewage.

(*c*) The collection and disposal of human and animal excreta.

(*d*) The disposal of garbage and waste of all kinds.

(*e*) Special rules which would prevent steamers polluting the waters of lakes and rivers with either kitchen waste or excrement.

The Municipalities.

In respect to the towns of Bracebridge and Gravenhurst, we are of the opinion that greater care should be taken by the local health authorities to maintain a higher standard of sanitation than at present exists, and we would urge the discontinuance of the present method of the disposal of tannery waste at the two Bracebridge tanneries.

The Village of Port Carling calls for special mention. At this important junction point the sanitary arrangements are not satisfactory, owing to the possibility of pollution of the waters both above and below the lock. It would, in our opinion, be desirable for the town to install a public water system and in the meantime do away with many of the unsanitary conditions to be found there at present. For the credit of the village, the site of the Indian encampment should be cleaned up and a fresh site selected for their future residence.

If, as we suggest, a public water system was installed, we would then be able to recommend the erection of a public convenience at a suitable place.

From our experience, not only in this particular district, we find as a rule local boards of health and municipal authorities generally fail to recognize the importance which should be attached to a more stringent sanitary inspection of summer resorts; indeed, with but few exceptions, these authorities fail to give the attention to the enforcement of sanitary laws and by-laws which either the Public Health Act requires they should, or which the financial importance to rural municipalities, the presence of so many summer tourists, implies. Indeed, considering the increased revenue from taxes which resorts have brought and will continue to bring to this class of municipalities, and the enormous increase in value which has occurred, especially in Muskoka District, it seems that it would only be making a just demand upon them to require the regular sanitary inspection of these municipalities, extending the same to the settlers' home as well as to the home of the summer resident.

We would note with pleasure the good work done in that portion of the district inspected within the townships of Medora and Wood mainly through the personal efforts of Capt. John Rogers, who has been a pioneer in sanitation as in other maters appertaining to Muskoka.

If the local authorities will not assume the responsibilities imposed upon them, it would seem that some such system of local self government, as that granted to the cottagers at Sturgeon Point, should be extended to other summer resorts in Ontario. Without sufficient local interest and inspection it will not be long before some of our summer resorts will lose the good reputation they now have throughout the continent, for given a few cases of enteric fever at any particular point, its reputation is blighted for many seasons. This is, however, less likely to occur where sanitary laws are properly enforced, yet it must not be forgotten that so important have become the summer resorts of Ontario to the people of the continent, that it almost becomes essential that the Province should have a more direct supervision of them than has heretofore been the case, and considering their vastness, their excellnce and increasing worth, it is essential for the maintenance of their high standard the control should be more central.

In conclusion, we would recommend that where marked individual instances of unsanitary conditions have been found to exist at the time of our inspection that those directly responsible for the same be communicated with and instructed to correct the same.

Report on Waters received from Captain Rogers, of Port Sandfield.

On September 30th, 1905.

Laboratory Numbers.	Senders' Numbers.	Where collected from.	Streptococci.	Staphylococci.	Colon Bacilli.	Colonoid Bacilli.	Chlorine in parts per million.
2933	78	Old school spring, Port Carling	None.	None.	None.	None.	10
2934	36	Johnston's well, Port Carling	None.	None.	None.	None.	12
2935	x20	Port Sandfield Hotel tank	None.	None.	None.	None.	2
2936	87	Hanna's well, Port Carling	None.	None.	None.	None.	2
2937	61	Maple Leaf Hotel, Windermere	None.	None.	None.	None.	2
2938	19	Belmont Hotel	None.	None.	None.	None.	2
2939	56	Potts' spring near Port Sandfield	None.	None.	None.	Present.	4
2940	66	River at inlet of Windmill pump	None.	None.	Present.	None.	3
2941	9	Indian Spring, Port Carling	None.	None.	Present.	None.	14
2942	43	Collins' spring	None.	None.	Present.	None.	4
2943	84	Jones' well at Pinelands	None.	None.	None.	None.	2
2944	77	Wm. Hurrella spring	None.	None.	None.	None.	4

Colon Bacilli mean intestinal origin of infection.

Colonoid Bacilli are suspiciously intestinal in origin.

Only four of these specimens show infection. But this speaks only for the time being. The surroundings are the most important factors to take into consideration in judging of the wholesomeness of a water.

Medical Inspector's Reports.

By R. W. BELL, M.D.

PRESENTED AT THE OCTOBER MEETING OF THE BOARD.

Report *re* Sanitary Conditions at French River.

To the Chairman and Members, Provincial Board of Health, Ontario:

GENTLEMEN,—At the urgent request of the President of the Ontario Lumber Company, whose mills are situated at the mouth of French River, and who reported an unusual prevalence of diarrhoea of late, your Secretary instructed me to proceed there at once to investigate, which I did, between Sept. 3rd and 6th.

I found the company's mill and a village composed mostly of their employees, on the east side of the river, a few hundred yards from its mouth. The total population is from 400 to 450, including a few Indians. About 120 men work in the mill, of whom about 60 are married, occupying houses belonging to the company, and about 60 unmarried, living in the boarding-house.

The cause of the diarrhoea was quite evident from the unsanitary condition of the place, and the utter disregard of the people for the most ordinary sanitary precautions, where more than ordinary care is required, to prevent pollution of the stream, because of the peculiar nature of the soil, or rather lack of soil, and rocky formation, whereby all liquids and soakage from closets, etc., are rapidly carried into the river, from which all water for drinking and domestic purposes is obtained.

Ridges of rock 10 to 20 ft. high and 10 to 40 or 50 ft. wide, run parallel with the river, each ridge a little higher than the previous one, to the 3rd ridge, with ravines 20 to 40 ft. wide between, two or three feet of earth in a few places, and in others only a few inches, being in the bottoms. Much sawdust has been spread in these ravines to level them and to make streets. Houses for the mill employees are erected on five or six of these ridges, a few yards apart.

The natural slope is south towards the mouth of the river, but occasionally in the opposite direction in some of the ravines.

There are many crevices or cracks in the rocky ridges, through which water trickles after rain falls and carries soakage to the river by shorter routes. There is scarcely any clay on the rocks, which have smooth steep slopes. The river is here from 100 to 150 yards wide, 500 or 600 yards up stream from the mill, Mr. Wabb has a store situated on a wharf, and a few yards back on a rocky ridge, his own and six or seven tenement houses. 200 yards further north is a camp of the French River Boom Company, who employ about 20 men for four or five months each summer.

This camp has just closed for the season.

The water supply for all houses owned by the Lumber Company is pumped from the river close by the mill (the intake pipe being out 40 or 50 feet, and about 15 feet deep) to an elevated tank, high on a rock behind the boarding-house, situated a little south and 200 or 300 yards east of the mill.

From this tank pipes run along the rocky ridges on surface of the ground to all the houses, but not in use in winter, when water has to be drawn in barrels from the river. The boarding-house is then closed.

The Lumber Company's dock is about 200 yards above the mill, and about 150 yards further up stream and on a high ridge is the "Hotel Coponaning," with an intake pipe from the river in front, the water being pumped by a wind mill, to a tank in the upper story of the building.

All closets, except in boarding-house and the hotel, are the *pit class*, but rarely any pit, as no soil, just erected on the smooth rocky slope, or at its base, close to back doors, and frequently opposite the fronts of other houses. Many are elevated 10 or 15 feet high, and reached by a platform from the rocky ridge. Rain runs down this rocky slope, carrying the soakage under the sawdust in the ravines to their outlet, or through crevices in the rock, from one ravine to another, until the river is quickly reached.

The "Hotel Coponaning" has two closets on a slope of rock to the north and back of the hotel, contents being washed into the ravine about 10 or 15 feet wide at ground level, but with sloping rock sides, and with 4 to 6 ft. of earth or sand in it. Two flushing water closets have been recently installed inside, and these with all house slops, discharge through an iron pipe, protruding from rear wall, three or four feet from ground, into the same ravine, all finding its way into the river one or two hundred yards north.

At Wabb's the closets are on the back of the ridge, and contents are carried to the river a few yards north.

The Boom Company's closet is on the ground, and has only a scantling for a seat. All soakage reaches the river through a few inches of soil over a flat rock, about 30 yards north.

Entering the river at the lower side of the steamer wharf, is a rapid streamlet, at present discharging a barrel of water every four or five minutes, after considerable rain. This stream comes from a pond between the rocks, 200 or 300 yards away, and runs through a hollow, which is being filled with stable manure, to make a garden for the tenant, about 60 to 80 yards back from the river. This streamlet is reported to be dry, and the pond stagnant in summer, except after heavy rain. At present this stream is manure soakage, and must also have the discharge from several closets.

The Lumber Company's boarding-house has inside flushing water closets, the sewer pipe emptying into a slip a few yards in front, and is discharged into the bay near the mouth of the river.

The closets on the vessels, frequently lying at the dock for an hour or two, are not locked, and may be in use, while garbage is thrown overboard, and adds to the pollution of the stream above the intake pipe. I, myself, saw that the closets on the "Britannic" were not locked at any port on my trip up, and I saw garbage and kitchen refuse thrown overboard at Parry Sound and also here.

The closets were not locked on the steamer "Telegram" when at the dock here on 4th instant. I warned both Capt. Wright of the "Britannic" and Clelland of the "Telegram" that closets should be locked while in port, and met with a short curt answer from the latter, who said "he knew nothing of any law requiring it, and if anyone had complaints to make, they could go on making them." "He had never locked up before and would not do so now." Capt. Wright was willing to aid in any way in improving matters, but points to the difficulty, when a lot of passengers on board and no accommodation provided for them on the dock. I pointed out that there should be a septic tank system on board or dry earth closets, for use in port.

I took samples of water, which Dr. Amyot has examined, and in three of them, taken close to the intake pipe, from 50 yards below the steamer wharf and from the streamlet, colon bacilli was found and much chemical pollution in the latter. The other samples from the taps in the boarding-house and Hotel Coponaning, and from in front of Wabb's dock, are reported as being all right.

To remedy matters, my recomendation is dry earth closets for all, except the boarding-house, where the sewer to the slip is satisfactory at present, and at the "Hotel Coponaning" where a septic tank would be preferable, as tile may be laid along the ravine. As dry earth is not obtainable, dry sawdust in abundance can be used. There is likely to be difficulty in getting individual attention to the matter, and it may be necessary to employ a scavenger continuously, to put sawdust daily in the closets, and keep up the supply, also to remove the contents weekly, and have it burned either in the mill furnace, or in one provided in rear of the village, in some rocky hollow, as there is no place within reach with earth enough to bury.

Mr. Wabb agreed to convert all his closets into dry earth at once, and do anything recommended, to improve the sanitary condition.

As there was no hospital building ready for use in case of emergency, I consulted with Dr. Leeson, the Lumber Company's physician at this point, and he stated that there was a building now used as a storehouse, near the store, which can be used for non-contagious diseases at a couple of hours notice. There are two small buildings, occupied by Indians at present, at sufficient distance back from the boarding-house, either of which might be repaired and cleaned up, and made ready for use if required for any contagious disease, and the other can be vacated at an hour's notice any time.

Since my return, I have communicated my findings and recommendations to Mr. Cook, President of the Lumber Company, and he declared his intention of at once carrying out the suggestions in regard to abolishing all pit closets, and substituting dry earth therefor, and have a company scavenger look after them; also to have the necessary hospital accommodation provided and held ready for use.

LABORATORY OF THE PROVINCIAL BOARD OF HEALTH.
TORONTO, Sept. 22, 1905.

Report of Waters received from Dr. Bell, Medical Inspector.

Collected from French River, September 8th, 1905.

Laboratory. Numbers.		Senders' Numbers.	Where collected from.	Streptococci.	Staphy lococci.	Colon Bacilli.	Colonoid Bacilli.	Chlorine in parts per million.
2610	1	61	Dock surface S. A. Wabbs	None.	None.	None.	None.	2
2611	2	34	Intake pipe	None.	None.	Present.	None.	2
1612	3	77	Below dock	None.	None.	Present.	None.	1
2613	4	55	Streamlet	None.	None.	Present.	None.	20
2614	5	73	Top in hotel Cuponairy	None.	None.	None.	None.	1
2615	6	78	Boarding house	None.	None.	None.	None.	2

The streamlet shows much chemical pollution, and at the same time is infected with colon bacilli.

JOHN A. AMYOT.

I would suggest that the owners of the various passenger vessels plying on the Georgian Bay and our inland lakes, be communicated with, in regard to he closing of closets and emptying of garbage overboard, while in any of our ports.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

September 28th, 1905.

Report re Sanitary Conditions, etc., of Cobalt and adjacent Mines.

To the Chairman and Members, Provincial Board of Health, Ontario.

Gentlemen,—Doubtless you are all aware of the recent discoveries of silver and other valuable metals in the Temiskaming District, mostly in the Township of Coleman, 103 miles north of North Bay, on the line of the T. & N. O. Railway. As a result there has been a sudden influx of prospectors, miners, etc., and on the shore of Cobalt Lake, a mining camp or town has within a few months sprung into existence.

I visited this place on March 6th, when there were only four mines in operation, and again passed through in early April, and also in the middle of May. At the latter date, there were not more than half a dozen small board or log buildings on the present town site.

Owing to communications received, regarding the rapid growth of the camp and its unsanitary condition, it was deemed advisable for me to visit it again this month. I reached there on 14th inst., and found a population on the town site, of about 600, sheltered in about 60 or 70 houses, mostly shacks, and as many tents. Many of these people are engaged in prospecting, and are independent of those actually engaged in the mines, while many avocations are represented. Two banks (one doing business in a tent), about a dozen general stores, with several restaurants, pool-rooms, barber shop, photograph gallery in a tent, two drug stores, and numerous other places of business were in full swing.

So far no sanitary precautions had been taken. About a dozen closets of the pit class were in use, and about as many more were in course of erection. Several houses were situated on what since the survey a few weeks ago, will be streets, and have to be moved.

A visitor walking about the place between the houses and stumps, had no way of telling whether he was on a street or private lot. The town site is on the shore of Cobalt Lake, which is about a mile long and 300 or 400 yards wide, the railway track running close along the bank, ten to twenty feet above the water, while the location rises rapidly and very roughly immediately beyond the railway track. The natural drainage, therefore, is all towards the lake, which along the shore is badly contaminated. There is only one natural "spring well" in the place, from which the whole local domestic supply of water is obtained, and it is so situated at the base of a rock, as to receive much surface water, and much filth. The owner was taking steps however to have it thoroughly cleaned out, and protected as far as possible from contamination, and going to have it closed in, and charge a fee for its use. This will, therefore, cut off the free use of any but the lake water, from the citizens.

With the Provincial constable, Mr. Caldbick, recently sent there by the Government and who is Sanitary Inspector, I made a thorough inspection of the place.

The erection of pit closets was at once stopped, a slaughter house in a most undesirable place, with hogs devouring raw offal in rear, was ordered to be removed; also a large manure pile both a nuisance and a menace to health, as well as unsightly, and which turned out to be on a street in the most thickly populated portion. The Sanitary Inspector was instructed to prosecute any persons committing or placing unsanitary nuisances, where they might prove detrimental to health.

A meeting of the citizens was being held in the reading tent, the first evening of my visit, for the purpose of organizing a School section, and I seized the opportunity of addressing those present, about twenty in number, in regard to sanitary matters. The following day, I caused the following notice to be posted in several conspicuous places.

Notice.

By order of the Provincial Board of Health, the use of pit closets in Cobalt and vicinity, is forbidden. The conversion of those already in use, to dry earth or other satisfactory kind, is at once required.

The deposit on the ground, of kitchen and other garbage or refuse where it may contaminate the water supply or prove a nuisance, is forbidden. Boxes or other suitable receptacles for it, must be provided, and emptied at a place approved of by the Sanitary Inspector, at short intervals.

Sewers or drains which may pollute the water supply or prove a nuisance, are also forbidden.

(Signed) GEO. CALDBICK,
Sanitary Inspector.

COBALT, Sept. 15th, 1905.

Soon after my return, I obtained from your Bacteriologist, a report of his examination of samples of water shortly before sent him, from spring furnishing most of the drinking water of the town, and also from Cobalt Lake. His report says, "The spring shows infection with intestinal bacteria. The lake shows infection with suspiciously intestinal bacteria. Neither of these waters should be used without previous boiling."

As these were the only sources of water supply convenient, and as they were still subject to much contamination, several copies of the following notice were sent to the Sanitary Inspector, to post in conspicuous places, for the information of the citizens.

Notice.

Samples of water from Cobalt, taken from the spring near Clark's, and also from the lake, have recently been examined by the Analyst of the Provincial Board of Health, and both have been found to contain germs which render their use dangerous. The public are therefore warned that these waters should be boiled, before they can be safely used.

By order of the Provincial Board of Health.

TORONTO, Sept., 1905.

Having taken these steps to get the sanitary condition of the town improved and started right, I turned my attention to the immediate location of the mines. I learned there were about eighteen mines being worked, and all within a radius of about three miles from Cobalt. I visited several of them, and found a decided improvement in the accommodation provided the employees, since my visit in March.

Nearly all had made contracts for medical attendance on their men, with either Dr. Field or Dr. Young of New Liskeard, who both had representatives at Cobalt, but there seemed lack of hospital accommodation as required by the regulations. As the largest of the camps at present consists of 60 or 70 men, and they vary from that number down to 8 or 10, these smaller ones could scarcely be expected to erect a hospital building at their individual mines. I therefore decided to call a meeting of the mine managers, to consider the matter, and sent the following letter to every mine manager whose name I could get, and several prospectors, some twenty-two in all.

COBALT, Sept. 15th, 1905.

DEAR SIR,—You are requested to attend a meeting of the Mine Managers of the Cobalt District, in the reading tent, Cobalt, on Tuesday, Sept. 19th, at 1.30 p.m. sharp, for the purpose of considering the most desirable method of providing hospital accommodation and medical attendance for your camp, as required by the Public Health Act.

(Signed) R. W. BELL,
Medical Inspector, Provincial Board of Health.

At the time appointed only seven responded to the call. To those present I explained the regulations, and pointed out that they were required to provide a suitable building for a hospital, and in it provide board and nursing for their employees, in case of illness or accident, as well as contract with a physician for attendance. I suggested that all, or any number who desired, might unite in the erection and maintenance of a hospital at Cobalt, the most central point, and within easy reach of most of the camps.

Six of those present announced that they had contracts with physicians at New Liskeard for medical attendance, and that they had provided hospital accommodation and board at the same place, and without any fee being charged to the men, beyond that authorized by the regulations for medical attendance. This statement was corroborated by Drs. McLaren and Aikins, the local representatives of the New Liskeard physicians who held the contracts. I stated that I did not think the hospitals at New Liskeard would be satisfactory to your Board, as too far away, but some of the managers said the outlet from their mines was via Haileybury, and when there, they were as near New Liskeard as Cobalt. The manager of the Buffalo mine, said he had no contract with a physician, and would not make one, and if we wished to prosecute him for refusal to obey the regulations, we could "put on the screws as quick as we liked." He took this ground because he had some grievance against a physician at a mine where he had been formerly employed. Afterwards he stated, if the Provincial Board wished to build and maintain a hospital at Cobalt, he would give two hundred dollars, or a car load of lumber towards its erection. As I was not erecting or soliciting subscriptions for a hospital in your behalf, I had to inform him, his offer was respectfully declined, but that he had better erect a building at his mine, which is inside the town site, or unite with others to do so, and otherwise conform to the sanitary regulations. He again very curtly and abruptly refused to do so. I suggested to those present, that they should appoint a committee, and confer with the absentees, and try to come to some united action, as I felt sure the cost to each would be much less, than if they were compelled to build separate hospitals, and the fact of the contract physicians, placing their representatives at Cobalt, showed they did not consider New Liskeard a near enough point, from which to operate the Medical Department. However, they did not feel disposed to take any action, and the meeting broke up.

As the fee for medical attendance and medicine charged to each man is only fifty cents per month, it seemed almost incredible, that the contracting physicians would without further payment, provide on behalf of the mine owners, hospital accommodation and board, with trained nurses as was asserted.

I requested those present, to send to your Secretary, copies of their contracts, so you might have proof, that the regulations even at the distance of New Liskeard were being so generously carried out.

Before taking further action, I deemed it best to return and confer with your Secretary, and as a result, the following letter was sent to each of the mine managers on September 23rd, instant.

> Dear Sir,—Enclosed find amended copy of Act and Regulations for sanitary control of Unorganized Districts in Ontario. Your attention is called to all its clauses, but particularly to clauses 2, 4, 8 and 12.
>
> Kindly let me know by return mail, the name and address of the physician with whom you have contracted (clause 12), also what provision you have made for hospital accommodation for the men in your camp (clause 4).
>
> Dr. R. W. Bell, Medical Inspector of the Board, who has just returned from your district, reports the majority of the camps are in the immediate vicinity of Cobalt. Should you desire to join with one or more of the mine owners, in the establishment and maintenance of an approved hospital in Cobalt or close vicinity, it will be acceptable to this Board.
>
> The fact of the physicians at New Liskeard, with whom I understand several mine owners have contracts, having representatives constantly at Cobalt, would clearly indicate that that is the most desirable or convenient place for a hospital.
>
> The utilizing of private hospitals at New Liskeard, miles away from your mines, is clearly not in the interests of your employees, nor in compliance with the Act.
>
> Yours respectfully,
> (Signed) Chas. A. Hodgetts, M.D.,
> *Secretary.*

I know from conversation with several of the mine managers, that although they think they are technically complying with the Regulations by providing hospital accommodation at New Liskeard, still they admit that Cobalt would be a much better point.

Some others in the neighborhood of Kerr and Giroux Lakes, say, Cobalt is as difficult to reach in summer as New Liskeard, and would prefer a hospital at Haileybury.

The difficult at present is to get the responsible parties sufficiently interested in the necessity for hospital accommodation, as they are all so engrossed in getting their mining operations into shape.

Fortunately, so far, there has been very little illness, and no serious accidents, and until there are, it will be difficult to get them to waken up, unless the penalties provided by the Act are enforced for non-compliance. I would like specific instructions in regard to this matter, and especially in connection with the defiance of Mr. Wells, manager of the Buffalo mine, whose action I fear, if allowed to go unnoticed, will be the cause of trouble in the future.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

September 29th, 1905.

Report re Smallpox at Hoard's.

To the Chairman and Members of the Provincial Board of Health of Ontario:

GENTLEMEN,—In the latter part of August, a request was received from Dr. Carlow, M. H. O. of the Township of Seymour, that a provincial officer should visit Hoards, where an outbreak of smallpox was reported, and assist in the diagnosis.

On August 30th, therefore, as requested by your Secretary, I visited this place with Dr. Carlow, and there found a Mr. Douald, a cheesemaker,in bed, undoubtedly suffering from smallpox. The rash was now beginning to dry up. He had taken ill on the 15th of August and ceased work the same day. Between August 15th and 20th he was seen several times by Dr. Bissonette of Stirling, while he had a high temperature, but smallpox was not suspected. On August 20th a rash appeared and the temperature fell to nearly normal. The nurse wrote Dr. Bissonette to this affect, but as he had been taking bromides the rash was attributed to them, and only on August 24th did Dr. Bissonette again see him, when smallpox was suspected and Dr. Carlow of Campbellford, M. H. O., was notified, and saw him next day in consultation, agreeing in the diagnosis. Immediately the cheese factory, and all employed therein. as well as several exposed persons living in the locality, were quarantined.

It was found that a Mr. Frost, living nearby, and who had been the milk drawer for the factory, had been taken ill on July 25th, but not so seriously as to stop work. About August 1st a rash appeared on him, and from this case it was suspected that Donald had contracted his disease. I found Dr. Carlow had full notes of Fronst's case as described by himself. However, I visited Frost, and from his own lips had a confirmation of the course his disease had run, although he persisted in asserting it had only been chickenpox and that he had visited Dr. Zwick of Stirling on 6th of August, who asked, onseeing the rash, if he had been poisoned by ivy, but on being assured not, he "pronounced it chickenpox and gave something to rub on, and take inwardly to scatter it." "The rash lasted for a week or more after this." Frost all this time and up to August 25th was drawing milk to the factory, also milking cows, with the rash on his hands, arms, etc., and taking this milk to the factory. All this he admits, and at the time I saw him, the bluish red marks were still quite distinct on his legs, arms, face, etc. There was every indication from the symptoms as described by him, that he had had smallpox of a mild type. For several weeks past, Frost had been frequently visiting his father who was paralysed, near Stockdale in the Township of Murray, ten miles distant, and he stated that a family named Smith lived in the house, and that Mrs. Smith was ill with a rash, said to be chickenpox.

In Hoard's cheese factory were 140 cheese made between August 10th and 25th, all from milk handled by Frost, and first five days also by Donald, also seven or eight made previously for patrons of the factory. All others made previous to August 10th were shipped on that date. This information was obtained from the assistant cheesemaker who is in quarantine.

I advised Dr. Carlow, M. H. O., and Mr. Johnston, Chairman Board of Health, to urge the factory managers to destroy the cheese, but the Local Board of Health to act as they saw fit in the event of refusal, as I felt they were the proper parties to deal with it and not your humble servant, although urged to pronounce definitely what should be done.

I understand Dr. Scherk saw Donald's case on August 25th, and Dr. Frederick saw both Donald and Frost on August 27th, and they also agreed in the diagnosis of smallpox.

A long letter dated August 28th, from Dr. Bissonette of Stirling to Dr. Carlow, discusses the whole case after careful consideration, three days after their diagnosis, and in this letter he speaks of scabs being still on Frost as late as August 25th. Frost reports Mrs. Smith, where he was visiting, as having recovered several weeks ago and no other cases known to him.

I fear these cases have arisen from ones of mistaken identity, like many we have had in the past, but why people will persist after the truth is known, in trying to blind themselves and their neighbours, is beyond comprehension.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

September 1st, 1905.

Supplementary Report re Smallpox at Hoard's.

As the stockholders of the cheese factory have been asserting that there has not been smallpox amongst their employees and inducing others to cast doubts on the diagnosis, your Secretary requested me to again visit Hoards, and see the patients and their present condition, and if possible trace the cases back to their origin. This I did on September 11th.

I found the cheese factory still quarantined and cheese not yet destroyed, the stockholders being determined to sell it, if they could in any way get the better of the Local Board of Health. Several of the leading stockholders I met, and had to listen to anything but complimentary language used towards all who dared say there was smallpox in the community, a marvelous indifference to the risk of spreading the dread disease if they could only sell the cheese and pocket the few dollars, the product of such a horrible crime. On good authority I was informed that the greatest loss to any one individual by its destruction, would be less than sixty dollars.

I visited Donald in his residence and found him convalescent, but several crusts still on him, especially about his ankles. He expressed a wish to go out of doors in his garden, which I thought not objectionable as the weather was fine, but I was afterwards informed by his neighbours that he had previously been out sitting at a corner grocery nearby, and notwithstanding the fact that they were all in one breath denying the existence of smallpox in the community, in the next they were threatening the Board of Health with dire vengeance, for not having a constable on duty to watch and prevent the patient from coming out.

Frost, who was present with several others, now alters most of his previous statements to me in regard to his symptoms and the course of his disease, all now an effort to disprove the smallpox diagnosis. He boldly asserted there was not a mark visible on him after August 9th, three days after he visited Dr. Zwick, and this in the face of Dr. Bissonette having seen crusts as late as August 25th, and my seeing many distinct marks on August 30th, and now to disprove his statements, making him roll up his shirt sleeves and shew fully twenty quite visible marks below his elbows.

I spent this and the following day in tracing these cases back to their origin. At Jas. Smith's in Township of Murray, where Frost had been visiting, I learned that Mrs Smith, her stepson, aged twenty-five, and two children 7 to 9 years old had all been ill with a disease very typical of smallpox, especially as described by the son. There was an apparent desire to conceal the nature of the disease at this house.

At H. Smith's near Chisholm's Rapids, I found there had been four cases, viz.: Mrs. Smith, Jr. brother-in-law, aged 18, and her children aged 16 and 14. The youngest child, age 14, I saw, and also Mr. Smith Sr., all others being from home. Mr. Smith gave me a very clear description of all the cases which was quite typical of smallpox, and from this house Jas. Smith's family were supposed to have caught it.

Dr. Simmons of Frankfort had seen the eldest girl in this family once with the rash in papular stage, and not the other members of the family. Dr. Farncomb of Trenton, I was informed, had seen Mrs. Jas. Smith once at his office prior to any rash appearing, and once at her home the first day of the rash.

Dr. Simmons visited with me the home of L. Foshay in Township of Sidney, from which place the H. Smith family was supposed to have become infected. A clearer and more typical description of smallpox, in the cases of these two people, it would be almost impossible to get, so that the further the cases were traced, the more pronounced were the indications that smallpox had been rampant for several months. Most of these cases were in adults, unvaccinated, and several stated they had had chickenpox many years before.

Beyond Foshays I could not trace the disease. He had been to Trenton, and Belleville several times prior to his illness, and there probably contracted the disease, possibly from transient visitors. So little was seen of any of the cases by the medical men who saw the Smiths and Frost, that it is not surprising that an error in diagnosis was made, but with the modified form of smallpox prevalent in many localities, which has been mistaken for something else, it behoves those practitioners who are not familiar with this dread disease, to exercise extra vigilance, and nip it in the bud, and so prevent its spread until it results, possibly in loss of human life, but certainly, as in this case, in heavy financial loss, for which the doctors, who detected and checked the spread of the disease, are being abused and maligned, while those who failed to recognize the earlier cases, (possibly through lack of opportunity to follow them up and study the symptoms,) are lauded to the skies as the only ones worthy of credence.

I have just learned that as the owners of the cheese, which was possibly infected, refused to destroy it, the Local Board of Health had to step in and destroyed it on 25th September, and are now threatened with damages.

That the cases dealt with in this report were smallpox, I am certain is beyond the shadow of a doubt as the fuller detail in my notes will show.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

September 28th, 1905.

Report re Smallpox.

To the Chairman and Members, Provincial Board of Health, Ontario:

Gentlemen,—During the past three months I have not been called to any smallpox in our unorganized districts, but there have been several cases reported in various parts of the Province, and nearly all dealt with by the Local Boards of Health.

Three outbreaks I have had however to deal with, and one of them at Hoards in the County of Northumberland, I have thought best to deal with in separate report. The others were in the Village of Stirling, and in Township of Faraday, County of Hastings.

In the former place on July 18th, I found a man who had recently returned home from Seattle in Washington State. At time of my visit there was much rash all over his face and body, on palms of hands and soles of feet, some in pustular stage, and some drying up. The patient asserted it was only poison ivy rash, and that it had been so pronounced by Dr. Zwick, his physician. Dr. Alger, M. H. O., having heard of the case and its suspicious nature, visited him and at once diagnosed smallpox, in which he was upheld by Drs. Potts and Faulkner, who were called to see the case. I am credibly informed that in the presence of these physicians, his attending physician agreed with the diagnosis, but when they were absent, asserted it was not smallpox, and went about the village boldly making these assertions. Dr. Zwick, the attending physician, was to meet me at the case, but failed to do so. Later in the evening I saw him, but he was quite unprepared to express any opinion about the case. The Board of Health, on my advice, had the patient at once removed to a tent and isolated, while several exposed persons were vaccinated and quarantined, and ere long the disease was stamped out.

The other outbreak, in the Township of Faraday, was reported by Dr. Embury of Bancroft, who stated there was a rash very prevalent and apparently infectious, in one of the schools, which he had temporarily closed. On visting the neighborhood and seeing several of the children, I concluded it was undoubtedly smallpox. In school section No. 5, where the school had been closed, Dr. Embury reported children of every family but one represented in the school, as having been affected with the rash.

We visited a union school across the border in Township of Herschell, and there found more than half the pupils, over twenty in number, either with rash now out, or signs of it having recently disappeared. This school was immediately closed.

General vaccination and the necessary quarantine, with disinfection of school buildings, etc., was at once taken up by Dr. Embury.

I was informed by Dr. Embury and also by Mr. Wiggins, Secretary of the Board of Health, that during an outbreak of smallpox in this township, three or four years ago, vaccination had been generally enforced in all the school sections except these two, where the disease is now prevalent, and that they, for some reason not now remembered, had been overlooked or neglected.

There have been so many people exposed in this neighborhood that I fear we have not heard the last of it in this or adjoining localities.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

September 30th, 1905.

Report re Pollution of Grand River.

To the Chairman and Members of the Provincial Board of Health, Ontario.

Gentlemen,—Having been requested by your Secretary to report upon the pollution of the Grand River at certain points, I started my investigation at Paris October 3rd.

The river as it flows through the town in summer is very shallow and easily fordable, a dam across it just below the railway bridge diverting most of the water into a raceway, to supply the Penman Woollen Mills. Nos. 2, 3 and 7, a small grist mill and the Albastine Works. The river Nith, with considerable volume of water coming from the north-west, supplies power to the Penman Mill No. 1, then running south for a few hundred yards, sweeps to the east and enters the Grand River about opposite Penman's No. 2 mill. A dam a little above its bend, diverts most of its water into a raceway running east to the Wincey Mill, and discharging a few yards below it into the Grand River.

At Penman's No. 1 mill, I learned that there were employed about 250 hands, viz.: 75 males and 175 females. In this mill there are five flushing water closets, and two opening directly over the raceway, all discharging into the Nith, also all washings, scourings and dye waste from the Aniline dyes used in this large mill, thence south 600 or 800 yards, and east about 200 yards to the Grand River. During the day, most of this Nith water passess through the raceway, and under the Wincey Mills, to which it furnishes power.

The Wincey Mill is situated almost in the heart of the town and employs about 80 hands, viz.: 70 males and 10 females. Here there are six water closets opening directly over the raceway, which also receives all the washings, scourings and dye waste of the mill, and discharges into the Grand River about 50 yards below.

On the opposite side of the Grand River are situated as before mentioned, the three Penman Mills, Nos. 2, 3, and 7, employing about 600 hands, viz.: 200 males and 400 females. Here I learned there were 15 flushing closets, all emptying directly into the raceway, together with all washings and scourings, but no dye waste, from this large industry.

A few yards below is a small grist mill on bank of the river, but only employing three or four hands, and no pollution of the stream from it of any consequence, except from a hog-pen in rear, which has been ordered to be removed by the local Board of Health.

A short distance beyond the grist mill is an alabastine mill, employing 10 to 20 men, according to the season.

One closet from the mill, and one from the office, discharge into the river. The sweepings from the mill—calcined plaster—are deposited on the bank of the river, and swept away with the spring freshets.

There are no other manufactories on the banks of the streams, but there are a number of private closets, back of stores, and also a short public sewer on the main street, discharging into the river at the outlet of the Nith raceway, where the odor was far from pleasant. Near the traffic bridge there was also a private sewer discharging, and was quite malodorous. The water in the river is frequently quite discolored from the dye waste from the mills.

The town's water supply is not obtained from the river, but from natural springs about two miles distant, and collected in a basin close by, then pumped directly to the mains; the surplus being stored in a reservoir on a high hill overlooking the town. The supply at present is ample, and apparently of a good quality.

I next visited Caledonia, a village a few miles below Brantford, with a population of 800 or 900. Here the river was very shallow and about 200 yards wide, but with considerable current, a long bridge spanning from the main street. The village has a water system for fire purposes, and to supply the railway tank, the intake being just above the bridge, and about 600 or 800 yards below the dam. This water is not used for domestic purposes, wells 18 to 20 feet deep furnishing the domestic supply.

A sewer about 400 feet long with 18 or 20 inch tile, for surface water runs down the main street, and has several short side sewers entering it. This sewer discharges 30 or 40 feet below the bridge, into the river during high water, but at the present time on to a low bank 20 feet back from the flow of the river. The Union Hotel closet is said to be connected with this sewer. Except in wet weather, there is little or no flushing except from the hotel closet.

A roller mill is situated on each side of the river close to the dam, employing 3 to 5 hands each. A few yards below the bridge there is an evaporator and canning factory, employing about 30 hands for three months in the fall. Tomato and apple pealings, etc., are thrown out on the river bank, but the M. H. O. told me the Local Board of Health had ordered their removal and this practice to cease. There was no other contamination of the river at this point.

Driving along near the river from Caledonia to Cayuga, about 12 miles, I noticed the banks were rather low and overflowed in spring. There is a fair current, but the stream is rather shallow in many places, with a good depth in others, and navigable for small steamboats. The water is dirty and muddy in appearance.

At Cayuga the river is 600 to 800 feet wide, and deep, and is crossed from near the centre of the village by a long bridge.

The domestic water supply is obtained from wells and cisterns, some wells are dug, and others drilled through 40 feet of clay loam. Cisterns are filled from rain water and occasionally from the river by cartage. Dr. Arrell, formerly M. H. O. (no appointment made this year) told me, that any cases of typhoid fever in the past, had been in families using well water, and none among those using cistern water from the river.

A couple of sewers partly open and partly closed for surface water, from near the Bank of Commerce, and Campbell House, joined by a few short branches, empty within 100 yards of each other near the bridge. The Court House a short distance further up, gets a water supply from a well, pumped to a tank in upper part of the building, and has a flushing closet and sewer to the river in rear.

The only manufactories are a grist mill and planing mill, but neither polluting the stream. From here to Dunnville, about 15 miles, there is a fair current and moderately deep water.

Dunnville, with a population of about 2,000 is situated on a flat, five miles from the mouth of the river. A long government dam with a bridge over it, crosses the river here, which is nearly half a mile wide, and has deep water above the dam. A feeder for the Welland Canal, starts through the town just above the dam. Many wells are in use, but a town water supply is pumped from the river 100 yards above the dam. The intake is under the guide pier in the edge of the steamer channel, in 18 feet of water. The supply is pumped to the G. T. Ry. tank (10,000 gallons) near railway station, seven hours pumping daily, keeping it filled, and from there the town is supplied by gravitation.

There are several sewers in the streets taking both surface and domestic sewage, but all lead to a stone culvert, under the canal, half a mile below the town, and thence a few hundred yards, through an open drain to the lower river. No water is used from below the dam, or canal.

Two knitting mills, employing altogether about 200 hands, are situated a short distance above the dam, but all washings, scourings and closets discharge into the sewer, and are carried to the lower river. Just below the dam there is a flour mill employing 4 to 6 hands, and a little further down a woollen mill, with 30 to 40 hands, both discharging a little sewage into the river.

There is deep water, with low banks from Dunnville to Port Maitland, five miles distant at the mouth of the river, where is an entrance to the Welland Canal.

Many summer residents spend two or three months here in a number of boarding-houses, and do considerable boating up the river and canal, and probably use more or less of the water, but the Lake Erie water is used for domestic purposes.

Beyond what I have mentioned and what contamination there may be from Brantford, of which I understand your Secretary has furnished a report, there is nothing more below Paris, except the trifling quantity from the farms along the river, and in most cases the buildings are well back from the stream.

Owing to non-arrival of sterilized bottles, I was unable to procure such samples of water as I desired, but bottles have now been sent out to the Local M. H. O., with a request to collect and forward as soon as possible, samples from points which I have indicated, the result of the examination of which will be submitted by your bacteriologist.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

Toronto, October 10th, 1905.

Report re Sources of Water Supply, Owen Sound.

To the Chairman and Members, Provincial Board of Health, Ontario.

Gentlemen,—Owen Sound having presented two schemes for increasing the civic water supply, your Secretary asked me to look over the situation, and report as to the sources, quantity of water, possibility of contamination, relation to sewers, etc. I therefore visited the town on October 16th instant and had every information given me, by the Mayor, Town Engineer, Town Clerk, Chairman of the Water Committee, and Dr. Cameron, M. H. O. The latter kindly gave up most of a day to driving me to the various points, and furnishing me with a fund of information.

The town supply at present is obtained from four springs, situated at a height of 201 feet, and probably fed from the Sydenham river some distance south of the town. The supply is not equal to the demand, and is only about 900,000 gallons per day, and this is much decreased as only between 500,000 and 600,000 gallons with reservoir full, are are available for use.

Two mains, one a 12 inch and decreasing to 10 inch and the other 6 inch all the way, carry this supply to the town. A small reservoir situated at the corner of Union and Garafraxa streets, 40 feet below the level of the springs, is kept well filled, and from it is pumped by a wind mill, to an elevated tank close by, a supply for this higher section of the town.

One scheme to increase the supply is to secure it from the Sydenham river, about three quarters of a mile from the present source, and a little above Inglis Falls, where a dam would be placed, retaining an ample supply, said to equal 13,000,000 gallons daily. The fall would be increased to 275 feet, and give a pressure of about 100 lbs. instead of 65 to 70 lbs. This water would be passed through filter beds, (the number to be added to as required, nature having provided most suitable locations close by), and into a pipe large enough for future use, thence to the present mains.

There are no manufactories on the stream above the proposed source of supply. The river rises in the Township of Holland, and between its source and the proposed dam, the only pollution would be such as caused by running through ordinary farms with pastures on its shores, and as the current is rapid and the water tossed up more or less, it will be comparatively pure even before passing through the filters.

The other proposed plan is to obtain the supply, by pumping from the Georgian Bay, from a point about two or three miles distant, either from the west or east side. If on the latter, from beyond Squaw Point, but possibly the former, the most desirable, as from deeper water, storms occasionally stirring up the mud. Here the supply of course would be unlimited, but there is also the possibility of contamination from the town sewage, which is discharged either directly into the bay, well up to the north end of the town, or through the Sydenham river, a short distance from its mouth, and the quantity of sewage will increase as the town grows.

There is no trunk sewer in town into which the others empty, unless we can so designate the Sydenham river for a few hundred yards above its mouth. I was informed there were sewers on Brown, Baker, Division and Union streets, leading directly to the river, these are oval brick 3x4 feet, also one out Bay street 18 inches and down Connell street, directly into the bay. On Poulette street, the principal business thoroughfare, there is no sewer opposite the block in which are the municipal buildings and the Paterson House, one of the leading and largest hotels. Shops with their backs to the river have private drains into it, and those on the other side of the street drain out to Baker street. On the west side of the river the sewers empty into the Potawatamie, a small stream discharging also into the head of the bay.

The Sydenham River scheme of water supply, entirely by gravitation, the Engineer informs me will cost $70,000 to $80,000 to install, and about $500 per annum for maintenance, to clean filter beds.

The bay scheme will cost $180,000 to install, and about $7,000.00 per annum for maintenance.

I believe samples of water from both sources have been examined by your bacteriologist, and reports furnished you.

All of which is respectfully submitted.

R. W. Bell,
Medical Inpsector, Provincial Board of Health.

Toronto, October 23rd 1905.

Report on Bedley's Hole, Mount Forest.

To the Chairman and Members, Provincial Board of Health, Ontario.

Gentlemen,—As per instructions given at your last meeting, I visited Mount Forest on October 14th instant, to examine a place known as Bedley's Hole, and complained of as a nuisance, by a couple of nearby residents, I found the spot complained of, in the north-western part of the town, one block from the main street, and close to the north-west corner of Elgin and Birmingham streets. It is a triangular hole about 100 feet long on Elgin street and close to side walk, about 40 feet wide across the end nearest Birmingham street, and probably 10 to 12 feet deep at its deepest point The sides are steep, especially on Elgin street. There is a general slope of the ground towards the hole from all directions, particularly the north and west. To the west, however, there is a flat for 100 yards or more, which holds much water as it comes from the hillside, and in spring it cannot get away fast enough through the hole, and occasionally floods across the street. The soil is sandy, and probably a quick sand in bottom of the hole, through which the water soaks away rapidly, and this appears to be the only outlet for the surface water from a large area in this part of the town.

It would seem as if it will be a difficult problem to drain this area, except through this hole, as its base is lower than any street where there is a drain. In summer all is dried up, and the soil is cultivated to its very margin and even down its sides. In spring there is such an area drained through this hole that it contains many feet of water and it is several weeks before all runs off. Stagnant water does not appear to be complained of, but occasionally dead animals are thrown into it, (a cat and a couple of hens last spring) and as it dries up, many polliwigs are left to die in its bottom, and cause a stench, particularly one evening last spring complained of. A bag full or two of empty fruit and vegetable tins, with some scraps of stovepipe, etc., have been secretly dumped on its slope. All these tend to make it unsightly if not unsanitary. Some years ago it was a common dumping ground for all kinds of refuse, and then was a nuisance, but of late years this has ceased, and the parties living nearest it told me they had nothing to complain of except its appearance, and one or two, of its danger, in case of children or others falling into it and being drowned. Only the Walkers and Doans complained of the smell, which was of short duration, but they claim it depreciates the value of their property. The Chairman of the Board of Health told me they had posted up notices, forbidding the deposit of any refuse, etc., in this hole, but the notices were torn down, and something offensive occasionally thrown in under cover of darkness.

So far as I can judge the hole is not a sanitary nuisance, except for a few days at most, in early summer, but with the refuse dumped on its side is rather unsightly; on the other hand it might almost be considered a safety valve, if kept clean, carrying off the surface water of a large area, which would if this were filled up, lie on the adjoining flat and become stagnant.

A few simple precautions, and prompt action on the part of the Board of Health, in preventing any deposits there, or removing at once anything undesirable which may have escaped their vigilance, and the sprinkling of some lime over its bottom if polliwigs, etc., are left after the subsidence of the water, will, I believe, overcome all ground for complaint. The place should certainly be fenced in, to protect passers by on the side-walk from possibility of drowning or injury by falling in, and it could at the same time be made somewhat of a protection against being made a refuse dump.

All of which is respectfully submitted.

R. W. BELL,
Medical Inspector, Provincial Board of Health.

TORONTO, October 23rd, 1905.

Report on Walkerton Sewer.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—As directed by you at your last meeting, I visited Walkerton on the 10th inst. to enquire into the complaint of Mr. P. Heffernan regarding a broken sewer being a nuisance, and beg to report, that I find Mr. Heffernan's statements substantially true.

The broken tile (18 in.) is the outlet on Queen St., of the main sewer running west on Durham St. and fed by several smaller sewers. There is a large volume of sewage discharging steadily from it, containing the house and closet refuse from many residences, and all is running into the Saugeen River close to the bank. Originally, tile pipe extended out into the river about 50 ft., but it is either all filled up or broken with ice, and now at the bank the tile is open in end and top, for several feet. A pool or eddy is formed behind some boulders just below the outlet and this is almost entirely sewage. Further out, the stream is swift and very shallow in summer, with rocks exposed which catch and hold much of the solids from the sewer. At the time of my visit the water was high enough to cover these rocks and carry the sewage off, but the boulders and shore line for several yards down showed sewage deposit.

A slaughter house on the bank of the river 50 or 60 feet from the sewer outlet, is said by the residents near by (five or six within a hundred yards) to be a greater nuisance than the open sewer. The property on which this slaughter house is situated is owned by Heffernan, but leased, and he wishes the town to turn the sewer down through his lot a few yards, a privilege he will grant, if they will forgo a judgment held against him for $300. There is considerable friction between them, and hence admittedly a reluctance on the part of the Council to do anything which will benefit Heffernan. I think it is a mistake to have this raw sewage enter the river at all, but until septic tank or other treatment of it can be adopted, the sewer should be repaired, and I recommend that iron pipe be laid, buried in the gravel of the shallow part of the stream (and can be easily done), far enough out to reach the deep water about two-thirds of the distance across the river.

All of which is respectfully submitted.

R. W. Bell,
Medical Inspector, Provincial Board of Health.

Toronto, Nov. 16th, 1905.

Report re Kettle Creek, St. Thomas.

To the Chairman and Members, Provincial Board of Health, Ontario:

Gentlemen,—Complaints having reached our Board regarding the pollution of Kettle Creek in the neighborhood of St. Thomas, the undersigned proceeded to that city on the 13th instant, to investigate, and beg leave to report as follows:—We find this stream from which the city gets its water supply, rising in a small lake of a few acres, near Belmont in County of Middlesex, then taking a south-westerly direction, sweeps with a tortuous course around the western part of the City of St. Thomas, thence running south through the townships of Southwold and Yarmouth and emptying into Lake Erie, at Port Stanley about 14 or 15 miles distant. In the neighborhood of St. Thomas we find it running through a deep ravine about 200 or 300 yards wide and with banks 80 to 90 feet high.

The water is very turbid and contains much clay from its banks above the city, but is not there otherwise polluted except by the ordinary pollution from farms along the shores. A dam across the stream, a mile above and north of the city, creates a pond, containing an ample supply of water.

This is conducted into a receiving basin 1,000 feet long by 125 feet wide, and 8 or 10 feet deep (containing five or six million gallons), usually by filtering through the bank and drain tile, but if necessary by an open gate, thence it passes into a well 10 to 12 feet deep, and is pumped into three large iron tubular filters 8x10 feet filled with sand, and thence into the mains.

Chemical precipitation takes place by the use of alum in the water before it is forced through the filters. If necessary, direct connection can be made with the mains, without going through the filters. One of these filters is washed daily. At present, about one and a half million gallons is being used every 24 hours, nearly one-third of which is supplied to the Michigan Central Railway Company (during the night), which, however, has its own pumping plant at Pinafore Lake, a pond of a few acres adjoining the Park in the south end of the city, with a capacity of 600,000 gallons daily, but only now furnishing half that quantity to an 80,000 gallon tank, for the use of the locomotives and shops, and the Y.M.C.A baths; the shops, etc., getting their drinking water from the city supply. A few wells dug through clay, are still in use in the city.

Main sewers with many branches running into them, run from east and west ends of the city along Talbot street to Elgin street, thence south on that street and through a ravine to Kettle Creek, about 300 yards below the old Turville mill. All the raw sewage of the city discharges through this sewer into the creek, south of the city, where only a few inches deep, certainly polluting it badly, as there is very little current or flow, except that caused by the discharge from the sewer pipe. As St. Thomas is not a manufacturing city, the bulk of the sewage is of domestic origin. The few manufactories in existence are mostly away from the sewer lines, and have pit closets for the use of their employees, but these, we are informed by the M.H.O., are cleaned out regularly by the town scavenger.

We think there is legitimate ground for complaint on the part of the residents along the creek below St. Thomas, whose stock is compelled to drink its sewage, as the greater part of its flow has passed through the city sewers.

We believe the remedy lies in passing the sewage through a septic tank, near the present outlet, where subsoil pipes could be readily placed.

All of which is respectfully submitted.

ALEX. THOMPSON,
R. W. BELL,
Medical Inspector, Provincial Board of Health.

October 23rd, 1905.

Report re Bothwell Cemetery.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your special committee appointed at the last quarterly meeting of the Board to visit Bothwell and investigate a plot of ground purchased about a year ago by one of the religious denominations for a cemetery and the location being objected to as a nuisance beg leave to report as follows:—

We went there on Thursday, Oct. 12th, Dr. Graham, the M.H.O. of the Town of Bothwell, and also of the Township of Zone, accompanied us to the grave yard (over a mile from the station) where we met all the householders (four in number) living within a radius of 500 yards from the cemetery, the house nearest to it being about 30 yards and the one furthest from it about 55 or 60 yards.

The plot occupies 7-8 of a acre situate wholly in the Township of Zone side of the boundary line between it and Bothwell West. The land around is flat, soil sandy for about four or five feet when quicksand is reached. One casket we were told was placed in water. The cemetery on the east and south side has a good road about 4 rods wide with open drains 2 feet deep on each side of the road, the earth from the ditches being scattered on the grave yard to raise the ground. On the south side of the south road where three or four houses are situated, besides the open drain 2 feet deep, is a tile drain 2 feet below the bottom of the open one and running the whole length of the cemetery.

On enquiry we were told the water flows in a northwesterly direction, consequently the flow will be away from the houses (see diagram). They also complained that their property depreciated one-half in value on account of its proximity to the burying ground. They expect the average number of bodies annually interred there will be about six, although only two bodies were buried there this year.

Fourteen bodies are now interred there, but twelve of them died years ago, the bodies being raised and reinterred in this cemetery. The grave yard may be a nuisance to those living in its immediate vicinity, but we are of the opinion that it is not an unsanitary nuisance.

All of which is respectfully submitted.

(Signed),

ALEX. THOMPSON, M.D.,
R. W. BELL,
Medical Inspector, Provincial Board of Health.

TORONTO, Oct. 24th, 1905.

Reports of Committees.

PRESENTED OCTOBER 24th and 25th.

Report No. 1 Committee on Legislation.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your committee on Legislation begs to report as follows:

Regarding the question raised by Mr. Dennistoun, Peterboro, as to the indefiniteness of the Act as it relates to the performing of the disinfection of a householder's premises at his expense, by an M. H. O. when it has been previously performed by the attending physician, we are of the opinion that Clauses 87, 88, 94, 95 confer similar powers upon the M. H. O., and attending physician in regard to the matter of disinfection of person, clothing and other effects and house. While Clause 81 makes it apparent that a Local Board of Health upon the receipt of a certificate of either its M. H. O. or any *other legally qualified* medical practitioner, it shall be the duty of any such local board to give notice in writing to the owner or occupier, etc., requiring him to cleanse, disinfect, etc., to the satisfaction of the M. H. O. Further, section 82 provides for penalty and gives authority to the local board to do the work at the cost of the owner or occupier.

This being the case we would recommend that the ambiguity be done away with and the sections be amended to make the meaning of the Act clear and distinct.

In the matter of the transit of bodies of persons dying of a contagious disease as set forth in the communication presented to the Board by Dr. Mullin, M. H. O., Brampton, we would recommend that the conditions laid down in the Regulations re Smallpox, Diphtheria and Scarlatina be continued; the claim made of the disinfection of the body of a person dying of either of these diseases under the process of embalming not having been in our opinion substantiated.

The judgment rendered re the Rose Ward vs. Lothian tried at Chatham in December, 1903, in the H. C. J. of Ontario, may seem somewhat remarkable in view of the interpretation set upon the Act, in so far as it relates to the matter under dispute, by this Board in the past.

The case was one where the Local Health Authorities kept a patient suffering from smallpox in a hotel for at least one week and also used it for purposes of quarantine, retaining all exposed to the infection for a period of at least two additional weeks after the removal of the patient, and as a consequence the proprietor of the hotel lost thereby, his hotel having first been used as a hospital and then as a quarantine station.

In view of the fact that Clause 93 plainly states the duties of the M. H. O., or Local Board of Health in such an emergency, where an isolation hospital has not been provided by the municipality under section 104, and that such action was delayed for a period of one week, during which time the hotel was used as a hospital contrary to Regulation 3 *re* Smallpox, which requires the M. H. O. to remove such cases at once to an isolation hospital or tent. Further, the hotel was continued as a quarantine station contrary to Regulation 4 re Smallpox.

It is apparent to your Committee that while the regulations convey the instructions of the Board as to the most efficient handling of smallpox by local health authorities in cases of emergency, yet they lack the weight their definitions would impart owing to the failure of section 93 to appear in the judicial mind of the same construction as set upon it by the Board as evidenced by the regulations 3 and 4.

And your Committee would recommend that the Act be amended in accordance with the regulations.

All of which is respectfully submitted.

Chas. A. Hodgetts,
Chairman.
W. J. Douglas.
R. P. Boucher.

Toronto, October, 1905.

Report of the Committee on Sewage and Water. (West.)

Report No. 4—Miscellaneous.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—The Committee on Sewage and Water (West) met on Oct. 23rd at 2.30 p.m., present Drs. Cassidy (Chairman), Kitchen and Hodgetts.

The following questions were considered:—

(1) The source of supply for the additional water supply of the Town of Owen Sound, the report of Mr. W. Chipman, C.E., thereon, the Laboratory report of the samples of water taken at different points in the proposed systems, also the report of Dr. Bell, who made an extended examination, were all carefully considered, and your Committee is of the opinion that the water taken from the Sydenham River is of sufficient purity to permit of it being recommended as the source of supply.

(2) The application of the Town of Dundas for the approval of a source of additional water supply. Your Committee, after considering the data and information furnished by Mr. Armour, C.E., and the report of Drs. Hodgetts and Amyot, agree with the latter report and would recommend that the Board approve of the same.

(3) The reports of Drs. Hodgetts, Amyot and Bell on the pollution of the Grand River were presented, but your Committee would defer reporting on this important question until the Laboratory Reports are completed upon the samples of water taken at various points in the river.

(4) The application of the Board of Health of the Township of East Zorra re the suppression of the nuisance created by the Tavistock Woollen Mill. An examination having been made by Drs. Hodgetts and Amyot and report presented thereon your committee would recommend the approval of the suggestion contained in that report.

(5) The question of the filtration of the Guelph water supply from the River Speed was considered as far as the documents in the possession of the committee would permit. The agreement of the Roberts Manufacturing Co., New Jersey was read, which is an offer to construct a mechanical filter with three circular filters of 15 feet diameter, each at a total cost of $12,450, but action was deferred until the representatives had been heard from. The representatives were heard from and the committee have nothing further to say.

(6) The papers and plans in connection with the sewerage system of the Town of Parry Sound, together with the letter of Dr. Davis, M. H. O., and the report of Dr. Bell, Inspector of the Board, were considered, but your committee deemed it desirable to defer making a recommendation until further information had been supplied.

(7) The petitions, letters, a report of investigation held by the Local Board of Health, also the report of Dr. Bell, Inspector, were discussed and your committee agrees with the opinion expressed by the Inspector.

(8) The last item considered by your committee was that relating to the pollution of Kettle Creek by the sewage of the City of St. Thomas, petitions regarding which had been presented to the Board at a previous meeting.

The report of Drs. Thompson and Bell in this connection has been considered and the recommendations contained therein are approved of by your committee.

(9) Your committee having considered the report of Drs. Thompson and Bell on the Bothwell Cemetery, are of the opinion that there is no insanitary condition present in the cemetery.

(10) Your committee have considered the correspondence and plans submitted by the municipal authorities of Parry Sound, *re* the sewerage of that town, and having heard the explanations made by Dr. Davis, M. H. O., who appeared before the Board as representative of the Council and Board of Health, would recommend that the corporation forthwith discontinue any further work on the sewers referred to in the communications of the Town Clerk, and the Council be recommended to immediately engage the services of a competent engineer to prepare plans for a sewerage system, and submit the same to the Board in conformity with section 30 of the Act, and that the same be submitted to the Committee on Sewerage and Water West for their consideration.

Signed,
J. J. CASSIDY.
ALEX. THOMPSON.
CHAS. A. HODGETTS.

TORONTO, October 25th, 1905.

Report No. 5, of the Committee on Sewage and Water Supply, West.

Re Fort Frances Sewerage and Water Systems.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—Your Committee on Sewage and Water Supply (West) met at 11.30 a. m. to consider the application of Fort Frances for a system of sewerage, and also for water works. The following members were present: Dr. Cassidy (Chairman), Dr. A. Thompson, Sr., and Dr. Hodgetts.

The objects to be attained by the proposed system of sewerage appear in the description of the system of sewers as given by Mr. Jno. Galt, which is hereby shown as part of this report.

Your committee having considered the matter, approve of the recommendations made in the report of Mr. Jno. Galt, with the exception, that a septic tank of sufficient capacity to bear the outfall of twenty-four hours sewerage be constructed on the bank of Rainy River, and that no raw sewage be discharged into the same.

(2) In reference to the application of Fort Frances for permission to install a system of water works in that town, the description of the proposed system given by Mr. Jno. Galt, is hereby appended and forms part of this report.

Your committee express approval of the contemplated system of water works; but would suggest that bacteriological and chemical analyses be made of the contemplated supply before it is installed.

And further, your committee would make it plain that if at any time the Board deems it necessary the town shall provide for an extension of the biological treatment further than that now required.

Also that it be a condition to the approval of the plans as amended, that the Council adopt a set of By-laws similar to the Model Plumbing By-laws, approved by the Board, and forward a copy of the same to the Secretary of the Board.

Your committee has further considered the objection raised by Mr. B. L. Phillips, Local Board of Health of Emo, a municipality lower down on the Rainy River. This gentlemen objects to the discharge of a raw sewage into the Rainy River, as the same is the source of the water supply of the residents along the river bank.

All of which is respectfully submitted.

J. J. Cassidy.
Chas. A. Hodgetts.
Alex. Thompson.

Toronto, December 1st, 1905.

To the Mayor and Council of Fort Frances, Ont.:

Gentlemen,—In compliance with your request I visited your town and examined the physical and other conditions, with special reference to suitable drainage, and the installation of water works, etc.

I found it necessary to obtain further information as to levels before I could determine the most efficient and economical system of drainage. Before leaving Fort William I arranged with my assistant, Mr. Evans, to see Mr. Gillon, your town engineer, at once, and get the necessary data, and, if possible, arrange to run up and look carefully over the main trunk outfall, which appeared to me to be desirable.

After securing this information I shall at once study the problem from every standpoint, and design the system on a broad and permanent basis, so that whatever construction may be undertaken, now or later on, will fit in with the ultimate solution.

As this, in all probability, will take some time yet to determine, I have decided to at once report on the waterworks requirements, which seem to me of immediate importance.

The accompanying plan will illustrate approximately the proposed system, which provides for a pumping station at the bend of the bank of the Rainy River, a short distance above the saw mill, and situated about a mile and a quarter from the centre of the present business portion of the town.

From an engineering and sanitary standpoint this location should prove most satisfactory, and likely to be quite remote from any objectionable contamination for many years to come, in fact, but for the sentimental objections to the saw mill operations, the site might easily have been about half a mile or so nearer town, where some saving of time and money for attendance and cost of fuel, etc., would be secured.

All things considered, however, with due regard to the future growth and prospect of Fort Frances, I think the location eminently satisfactory.

The system generally should consist of a 12 inch intake submerged pipe laid out into the current of the river say about 150 feet, more or less, so as to lead water into a well located at the river bank, where screening and settling may take place.

From this well water can be lifted and forced into a 10 inch supply main about 6,350 feet in length to the centre of the distribution pipes in town, which will consist of about 3,000 lineal feet of 8 inch and 3,000 feet of 6 inch cast iron mains, the whole supplied with 21 fire hydrants, 34 gate valves, and all the necessary fittings.

In order to simplify and economize in corps of attendance and pumping I would suggest the erecting of an elevated storage tank of about 100,000 gallons' capacity, sufficiently high to give good domestic service and fair fire pressure, because special high pressure of about 100 lbs., when occasion demanded it, could always be quickly secured by shutting off trunk connection and pumping from the well direct into the mains, this arrangement giving increased safety and correspondingly better insurance rating.

Taking into account your present peculiar conditions, and early prospects of obtaining electric power, I would suggest your erecting a temporary power house building, and providing a portable steam boiler and pump, until such time, say three years, when a permanent building could be laid out and erected suitable for electric power, and by that time your waterworks system ought to be on a good paying basis.

The following is an estimate of cost for this project:

Fort Frances Waterworks, Estimate of Cost.

150 lineal feet 12 inch cast iron submerged intake pipe		$700 00
6,350 " 10 inch force supply main	$10,000 00	
3,000 " 8 inch distribution main	4,000 00	
3,000 " 6 "	3,000 00	
		17,000 00
12,500 feet total.		
35 tons special castings		300 00
21 fire hydrants		800 00
34 gate valves and boxes		800 00
Pump well		700 00
Pump house (temporary) building and land		1,000 00
Portable boiler and pump		2,000 00
Elevated storage tank		6,000 00
Engineering, legal and contingencies		1,700 00
Total		$31,000 00

The total of $31,000 is, I believe, an outside figure, and will provide for first class material, and construction of sufficient size, etc., to suit large growth and expansion of your town.

If elevated storage tank was omitted the initial cost, of course, as capital expenditure would be less, but the annual charges for providing extra attendance and corps for pumping day and night would about double the interest and sinking fund for the additional $6,000, and the system not be as safe and certain as with it, so I have included this extra expenditure.

If the 10 inch wooden pipe was used a saving of about $3,000 could be effected, which would bring the total to say $28,000, and I would have no hesitation in using this special pipe now, because it has proved itself to be thoroughly durable and reliable, and, if pump house was located near town, another saving, doubtless of about $2,000, could be made, bringing the whole total expenditure for waterworks down to about $26,000.

I do not care to recommend this latter saving, however, and believe you will be of a similar opinion.

The matter of a first class waterworks system, therefore, for Fort Frances, as explained and laid out per accompanying plan, using 10 inch wood supply main, means a total expenditure of $28,000, or, without storage tank, $23,000, which appears to me to be reasonably low considering the great benefits that are to be derived from an unlimited supply of beautiful water, with first class domestic pressure and fire service combined.

Electric Lighting.

I have given the question of electric lighting some thought, and it occurred to me that a suitable plant could be installed in pump house at same time as waterworks, for an additional cost of about $7,000, because the same boiler, power and engineering attendance could be utilized, so that operating the two together would be a profitable undertaking.

I would recommend installing say a 60 K.W. alternating single phase generator, with suitable engine, which, together with exciter, suitable wood pole line, transformers and street lamps, etc., would cost about $8,000.

This would be of great service to your town for a few years, until such times as hydro electric development is completed and available for use, instead of steam power.

Hardly any of this expenditure would be wasted, excepting the boiler, and, perhaps, part of temporary building.

If this project meets with your approval, and also the approval by vote of the ratepayers, it might be possible to accomplish a great deal even this season, especially in the way of installing the electric lighting, and during the coming winter the various contracts for waterworks material and labor could be let and arranged for so that this work could all be completed early next summer.

Hoping to hear from you at your earliest convenience, and promising you my conclusions as to proposed drainage at as early a date as possible after receiving complete data now being collected, I remain,

Yours faithfully,
John Galt,
Consulting Chief Engineer.

Appendix to Report re Fort Frances.

Report of John Galt, C. E. and M. E., on Fort Frances Sewerage and Water Works,
Toronto, October 20th, 1905.

The Mayor and Council, Fort Frances, Ont.:

Gentlemen,—I have now completed my preliminary investigation into your drainage problem, and beg herewith to report as follows:

The accompanying plan shows the conclusions I have reached with a view to the best and most economical solution on a satisfactory permanent basis.

After designing and planning the work on different solutions, and taking full cognizance of all conditions, including size of sewers and depth of excavations, I have come to the conclusion to recommend the plan as laid out on accompanying drawing as the proper one to follow.

I find that to provide for a proper outfall along Third Street to the cemetery, with an outlet, would require heavy cutting and general excessive cost quite beyond the needs of the town, and that every purpose can be well secured in an efficient and economical manner by discharge through about 800 lineal feet of 16 inch cast iron submerged outlet into the river below the falls at First Street, with a special manhole having storm water relief outlet at shore end.

The large volume of water constantly flowing over the falls, or through the tail race, will so dilute the sewage that no nuisance of any kind whatever can possibly take place, as the discharge from the outlet will be so far into the stream that even the eddying water in the bay towards the Hudson Bay Creek will not show any signs of visible contamination.

I find, also, that the cost of the construction will be considerably less than building the outfall along Third Street to the cemetery grounds.

I do not believe there can ever arise any reasonable grounds for sentimental objection to this outlet, but, if ever it was desired after many years, there would be little or no difficulty in diverting to by the construction of a new outfall further down the river.

The sewage on Third Street, including Cornwall and York Avenue district, west of the railway, can easily be brought into this common outlet at First Street, and west beyond this district. If need be, in years to come a new and separate outlet can easily be adopted.

My plan would be to adopt a 20 inch sewer pipe from the manhole at end of submerged pipe up along First Street to the intersection at Mowat Avenue, then an 18 inch intercepting sewer should run both ways along Mowat Avenue north to McKenzie Street, and south to Nelson Street, from which intersections main laterals of 18 inches and 15 inches would run easterly along these two streets practically to the corporation limits of the town.

This main intercepting sewer on Mowat Avenue, with the main laterals on McKenzie and Nelson Streets, would practically drain the entire town by means of the smaller 9 inch and 12 inch subsidiary laterals, all as clearly indicated on plan.

The Mowat Avenue drain would not only receive the drainage at each end of the two districts north and south, but would receive direct from the east and the west the drainage of the central districts in what is likely to be the business portion of your town.

In this way good results will be secured at the minimum of cost, both during the present or immediate period of construction as well as in after years when the districts are fully occupied by population.

The district north of McKenzie Street can also be drained into the main when it is required.

My object in continuing the intercepting drains on Mowat Avenue to Nelson Street is to get slightly lower ground, and provide for drainage along the river front, and at the same time take advantage of the natural drainage both ways, north to McKenzie and south to Nelson Street from the higher ground formation along Scott Street.

The system I have designed is a complete one for simultaneously taking care of all surface subsoil water and sanitary drainage, except a very small portion of storm water which may easily find its way direct into the river, and is also arranged to utilize a cleansing flow through the principal line of sewers by permitting inlets from Rainy River.

I will now assume that you wish to construct a portion of the work for the immediate draining of the principal blocks in the central district, and for this purpose submit herewith an estimate of probable cost, as follows:

Estimate of Cost for Partial Construction of Sewerage.

800	lineal feet	18 inch	cast iron outlet	$4,500 00
800	“	20 inch	sewer piping outfall	1,600 00
1,800	“	18 “	“ intercepting mains	3,500 00
800	“	18 “	“ lateral mains	1,500 00
1.000	“	12 “	“ “	1,200 00
3,000	“	9 “	“ “	2,200 00
8,200	Total.			
18	manholes			1.500 00
24	catch water basins			1.500 00
				$17,500 00
	Engineering and contingencies			1,500 00
	Total			$19,000 00

I may add in conclusion that the laying of the 18 inch cast iron outlet might easily be postponed for a year or more, because by screening at manhole, it would be some time before the volume of house sewage would produce any nuisance, and, by deferring this, your immediate total expenditure for sewerage could be reduced to say about $14,000, which is a very moderate expenditure for the advantages to be obtained by this municipal improvement.

If you should decide to do any work at an early date I should be pleased, on hearing from you, to again visit Fort Frances and arrange for making a careful and accurate survey, which is necessary for the preparation of working detail plans and specifications, etc.

Meantime shall be pleased to give you any further information bearing on this subject.

Respectfully yours,
John Galt,
Consulting Engineer.

Report No. 6 of the Committee on Sewage and Water, West.

Re Hamilton Annex Sewer.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—Your committee, having considered the plans and report of Mr. E. G. Barrow, C.E., engineer of the City of Hamilton, and having heard from that official personal explanation regarding the proposed system of sewerage of that portion of the City of Hamilton called the Annex, desire to submit the following excerpts from the engineer's report to the chairman and members of the sewer committee of that city, the same being a concise statement of the proposition ad outlets of the sewers, and the manner in which that officer proposes to readjust the disposal plant.

Hamilton, August 16th, 1905.

Chairman and Members of the Sewers Committee:

Gentlemen,—As instructed by your committee, and also by the city council, I herewith present to you a report setting forth what, in my opinion, is the best way to provide sewerage for the newly acquired territory at the east end, commonly called the "new annex," and also for a tract of land on peninsula lying between Sherman Inlet and Wentworth Street, and just north of the East End Disposal Works, together with a report as to whether any new disposal works, re-arrangement of existing ones, or new system of purification may be necessary by reason of the drainage of the new territory.

Accompanying the report, and forming part of it, are plans and profiles, which show the exact location and size of each sewer, and site of proposed new disposal works.

I concluded that the tract of land situated immediately south of the new annex, and extending southerly to the brow of the mountain would, in the near future, form part of the City of Hamilton, and, as the water falling on this tract of land would naturally flow through the annex to the bay, in making my calculations for the size of the sewers, the area of this tract was included and added to that of the new annex. I consider this of great importance. A rainfall of 1½ inches an hour, all of which would reach the sewers, was adopted as the rainfall to provide for in calculating the size of the sewers. This is providing thoroughly for floods, as it is not likely that such a flow will ever reach the sewers, but, as the cost of constructing sewers capable of receiving this flow is not very much greater than that required for sewers receiving a more moderate flow, I concluded it wise to amply provide for any floods which may arise in the future when the city fills up, which it, undoubtedly, will. After examining the levels and ground I determined that Trolley Street was the best position for a main sewer, which may be produced southerly when required. The size of it is 6 feet in diameter and circular, and its outlet is in Stipes' Inlet.

The plan plainly shows the position of the trunk sewers, and I cannot do better than refer you to it for a thorough comprehension of their location and size.

With regard to the piece of land referred to heretofore as a peninsula, and being just west of Sherman Inlet, I might say that it was found impossible to drain southward, either to the East End Disposal Works or into the new annex, so that I determined to utilize the present 18 inch pipe which now carries the effluent from the East End Disposal Works as the main sewer of this small district.

The formation of the land here is such that any excessive rain or storm water can be carried on the surface of the ground to the inlet or bay (close at hand). A small automatic acting septic tank would be placed at its outlet to prevent pollution of bay water.

It will be necessary to erect a disposal works at the terminus of the new main sewer on Trolley Street, and, in order to reduce the number of stations, I have devised a plan by which the east end disposal works may be abandoned, and the dry weather flow at present received at these works diverted at a point in the Wentworth Street main sewer just opposite the south side of Woodland's Park, as shown on plan. From there the sewage will be sent easterly along Myler and Princess Streets (intercepting Birch Avenue sewer), thence to the new station at the foot of Trolley Street. The storm water will still flow into the coal oil inlet.

The land contained at the East End Disposal Works could be disposed of for a factory location, there being railway siding into it, and it is well situated for such a purpose.

The machinery could be used in other works.

With regard to the most efficient class of sewage disposal works, I have had the best possible information with regard to sewage purification, and find that a difference of opinion exists among scientists as to the very best plan, but the majority favor the biological plan, or that by means of which bacterial of certain kinds effect the purification. There is one point on which all agree, and that is that a certain amount of tankage is required in every class, and, as the chemical precipitation tanks can be easily converted into the septic tank (of the biological plan) we cannot err very much in providing the necessary tanks. The septic tank has to be made larger than the chemical tanks, but the expense of operating in the biological plan is very much less, as far as I can learn.

I, therefore, would recommend the septic tank in this case, as I believe it will be found less expensive to operate and maintain.

The sewage disposal works, when completed, and the above plan put into effect, would thus consist of:

West End Works (biological).
Ferguson Avenue (chemical precipitation).
Trolley Street (biological).

The Wentworth Street plant would be done away with. The money derived from its sale could be used for building new works, if so desired.

The council were perfectly correct in having a thoroughly comprehensive system of sewers laid out, but there is no necessity of going to the expense of it all at once.

For instance, the building of the disposal works at the Trolley Street outlet of main sewer should be delaped until the sewage is sufficiently great to demand their construction.

The diversion of the Wentworth Street dry weather flow easterly might also be delayed for a time.

I believe if the main sewer on Trolley Street was constructed to Princess Street, and a sewer constructed westerly on Princess Street to Sherman Avenue, the immediate needs of the district would be met, as the lateral sewers coming into them would be built, as usual, under the local improvement plan.

It would be advisable to visit some of the bacterial plants lately constructed and in operation in the United States before commencing work on any disposal station here, as much useful information may be gained in this way.

Appended are approximate costs of the sewers needed.

Respectfully submitted,
(Signed) E. G. Barrow,
City Engineer.

It will thus be seen that the plan is to construct a six-foot trunk sewer on Trolley Street, a section of which is herewith submitted, with the necessary laterals, and erect disposal works at the terminus of sufficient capacity to treat the sewerage at present provided for at the East End Disposal Works. The sewage (dry weather flow) for this area being diverted into the annex system as indicated by the engineer in his report.

Your committee would point out that the engineer recommends the construction of a septic tank at the outlet, but does not refer to any subsequent method of treatment before the effluent is run into Burlington Bay. This is only one of the factors in the biological process, and it is quite evident that additional treatment will be necessary other than that proposed, particularly as in the annex will be located many industrial works, each of which may subsequently be required to treat its trade waste.

Your committee, therefore, recommend that the aforesaid application of the City of Hamilton be favorably entertained. It is clearly understood that when the City of Hamilton is prepared to construct and operate the new trunk sewer, the construction of the same taking, as stated by Mr. Barrow, C.E., about twelve months from the beginning of the construction, sewage disposal works shall be constructed below the mouth of the trunk sewer.

All of which is respectfully submitted.

J. J. Cassidy,
Alex. Thompson,
Chas. A. Hodgetts.

Toronto, December 1st, 1905.

Report No. 5, 1905, Committee on Sewerage and Water, East.

Re Belleville Water Supply.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—In reference to the proposed change in *re* "Belleville Water Supply," your committee begs leave to report as follows:

The present water supply is taken direct from the Bay of Quinte, at a point west of the outlet of the Moira River, about 1,500 feet from the shore, and is liable to contamination. *Re* proposal submitted to us, viz., to sink a series of wells on Zuwick's Island, which is a natural sand and gravel bed, and carry the water through a main by gravitation, to a pumping well near the present pumping station, and thus supply the city with, we think, a good pure filtered water. We would, however, recommend that samples of water from the proposed source be submitted for both bacteriological and chemical examination, and, if found satisfactory, that the request be granted.

R. P. Boucher.
Wm. Oldright.

Report No. 6 of the Committee on Sewerage and Water Supply, East.

Re Nuisance at Napanee.

Gentlemen,—Your committee begs leave to report that this matter is one which can and should be dealt with by the local health authorities and police magistrate, or, in the event of their failure to do so, it is competent for those who have brought the matter before your board to bring it before the civil or criminal court having jurisdiction in their own locality.

Signed,
R. P. Boucher.
Wm. Oldright.

Toronto, October, 1905.

Report No. 7 of the Committee on Sewerage and Water Supply, East.

Re Application of F. W. Galbraith, Esq., Port Hope.

Gentlemen,—Your committee begs leave to recommend that this application be not approved. Your committee cannot find from the evidence and facts submitted to it that there is good reason for the applicant not availing himself of the sewers on the streets immediately north and south of the block in which is situated the water course which he proposes to convert into a sewer. Nor does your committee think it well to recommend that an additional sewer should be made to empty into the creek, to add to the unsystematic, and promiscuous sewage disposal of Port Hope.

Your committee would rather recommend that the municipal authorities of Port Hope should again have pressed upon their attention the request of your board that they should co-ordinate their sewerage into some systematic plan, and send to your board a report of the same.

Signed,
R. P. Boucher.
Wm. Oldright.

Toronto, October, 1905.

Report No. 8 of the Committee on Sewerage and Water Supply, East.

Re Cannington Sewerage System.

Gentlemen,—This is another of a series of cases which have come before your board where a private individual has taken the initiation in what later becomes the sewerage system of a municipality.

Your committee would recommend that the municipal authorities be requested to have an engineer make a plan and specifications of a proposed system of sewerage of which this sewer now proposed shall form a part, and submit the same to the board.

Signed,
R. P. Boucher.
Wm. Oldright.

Toronto, October, 1905.

Report No. 9 of the Committee on Sewerage and Water Supply, East.

Re Sewerage of Belleville.

Gentlemen.—Your committee begs leave to hand you herewith a report on the sewage of Belleville by Drs. Boucher and Hodgetts, and would recommend that the outfall sewer be so situated that the sewage can eventually be treated by some method or methods or purification if this be found to be necessary by the Provincial Board.

Your committee would, therefore, draw attention to the remarks made by these gentlemen as to the desirability of the position indicated by them as an alternative to that indicated by Mr. Carrs. This is a problem which should be finally dealt with after further consideration by an engineer, and in no case should the sewage be passed into the lake or Bay of Quinte without placing the outfall so that the purification may be carried out should the board so decide either in the near or distant future.

Signed,
R. P. Boucher.
Wm. Oldright.

Toronto, October, 1905.

Report No, 1, Committee on Ventilation and School Hygiene.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—Your committee has considered the plans and specifications submitted by Mr. Cahoon regarding his patent for the ventilation of cellars, and would state that it seems to be a modification of a mode long in use in connection with the Ruttan and other systems of ventilation.

The principle in these is an excellent one, but it must not be forgotten that the use of the stove pipe in the way suggested by the patentee may lessen the draught supplied to the fire in the stove.

All of which is respectifully submitted.

Chas. A. Hodgetts,
Chairman.
J. J. Cassidy,
Wm. Oldright.

Returns of Contagious Diseases for the Year 1905.

Showing Mortality, Cases by Months and Death Rate.

1905.	Population reported on.	Smallpox.		Scarlatina.		Diphtheria.		Measles.		Whooping Cough.		Typhoid or Malaria.		Tuberculosis.		Total deaths from all causes.	Rate per 1,000 per annum.
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
January	2,019,590	10	..	223	12	412	67	268	4	27	4	69	21	174	169	2,216	13.1
February	1,935,897	8	..	209	16	270	35	119	2	22	3	43	19	177	165	2,263	14.0
March	1,946,271	16	..	168	8	223	27	154	5	54	5	30	16	208	200	2,417	14.9
April	1,903,402	70	2	157	7	212	27	494	27	45	4	37	10	211	198	2,164	14.6
May	1,980,887	35	..	89	6	220	31	880	1	89	3	31	18	204	200	2,148	13.1
June	2,059,515	19	..	96	5	212	40	420	11	40	8	43	19	210	207	1,933	11.5
July	1,959,311	8	..	52	2	128	12	90	3	80	21	89	19	166	144	1,871	11.4
August	1,990,065	8	1	30	2	132	21	26	4	141	16	256	43	153	147	2,200	13.2
September	2,010,100	14	2	27	1	143	20	32	1	97	13	278	45	153	152	2,128	12.1
October	1,984,157	63	..	96	1	191	29	25	1	36	6	350	48	170	163	2,047	12.3
November	2,010,532	183	..	122	5	267	30	28	3	85	11	210	55	134	134	2,080	12.4
December	1,959,700	123	..	151	5	231	28	40	2	35	6	307	48	172	172	2,116	12.9
		549	5	1,420	70	2,641	367	2,576	64	751	106	1,743	361	2,132	2,051	25,583	

Average death rate per 1,000, 12.8.

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